

The IRON AGE

March 20, 1958

A Chilton Publication

The National Metalworking Weekly



W. C. Denison

**How to Make
A Success of Selling
Your Company P. 57**

**Stainless Gets Set
For Aircraft Surge**

- P. 62

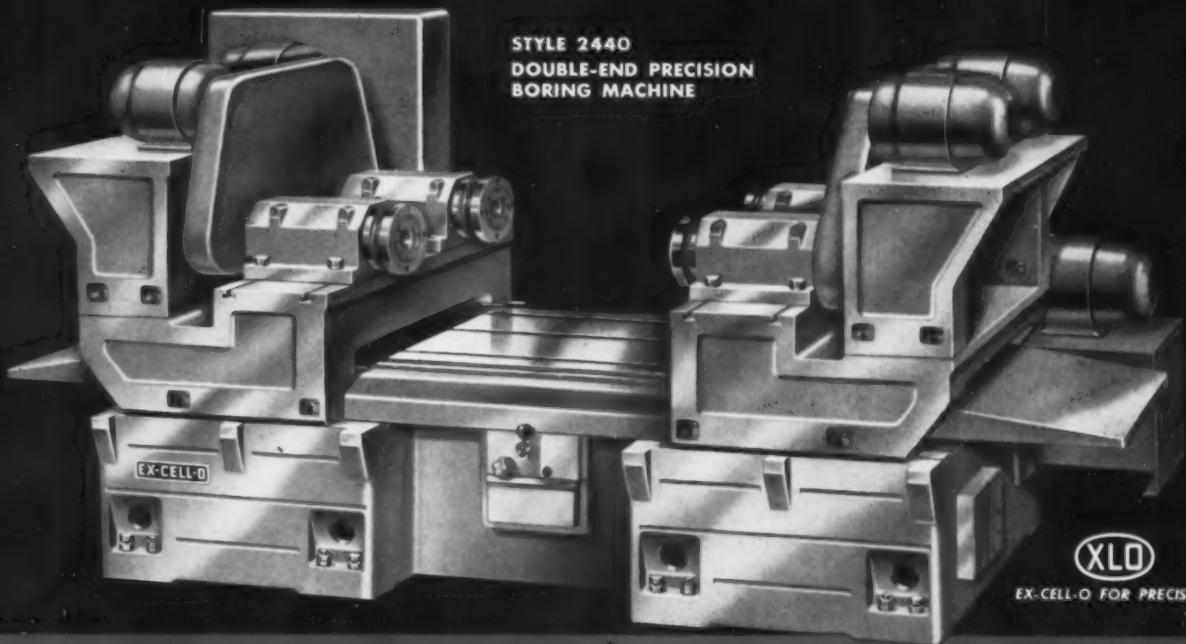
**New Approach
To Wear Resistance**

- P. 97

Digest of the Week

P. 2-3

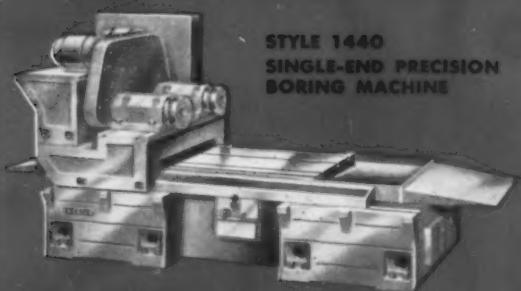
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STYLE 2440
DOUBLE-END PRECISION
BORING MACHINE



EX-CELL-O FOR PRECISION



STYLE 1440
SINGLE-END PRECISION
BORING MACHINE

TWO NEW HEAVY DUTY PRECISION BORING MACHINES

EX-CELL-O BORING MACHINES perform better because of deep-down solid construction, high precision and exceptional versatility. The minute you put one to work profits go up, operating costs go down. And these two new additions to the Ex-Cell-O line are no exceptions:

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Whichever model fits your particular production

requirements—you'll find their rugged versatility performs a wide range of rough, semi-finish, and finish operations which lowers your per-unit costs, increases your potential profit.

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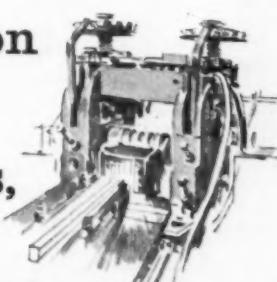
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The IRON AGE

March 20, 1958—Vol. 181, No. 12

Digest of the Week in

★Starred items are digested at right.

EDITORIAL

Courage to Withdraw: Some Will
Need It Soon

NEWS OF INDUSTRY

★Special Report: How to Make A Success of Selling Your Company

★Warehouses Expand Net Pricing
Scope Spies on Wing Interior

★Stainless Gears for Aircraft Era

★Grim Forecast on Steel Imports

★Plastic-Coated Pipe Branches Out

★Don't Spend Your Tax Cut Yet

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Men in Metalworking

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NEWS ARTICLES

STAINLESS AIRCRAFT

The Market Is Growing—Stainless steel producers and aircraft designers are feeling their way into



a new era. The potential is great, but the technical problems are wrinkling brows.

P. 62

STEEL IMPORTS

Curb Urged—Unless Congress acts, says Robert Lynch of Atlantic Steel, it's only a matter of time until imports hurt all U. S. steel mills. American foreign policy, he maintains, allows importers to take over domestic markets. P. 64

TAX CUTS

Little Agreement—Tax cuts aren't coming easily and there will be little help for business in any case. Congress and administration are not entirely agreed on timing.

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NEWS ANALYSIS

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★Washington

★West Coast

★Machine Tool

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AUTOMATION

For Short Runs — A common belief that long runs are needed to make automation pay is disproved

Metalworking



by Ford Tractor and Implement Div. engineers. It's more a matter of integrating product designs.

P. 74

FOREIGN AID

Too Much Waste — GAO tells House that too much foreign aid is carelessly going to waste. Result may be a closer scrutiny of future requests for funds to make sure of real need.

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FEATURE ARTICLES

WEAR RESISTANCE

Melting Point Theory — In testing this theory, sandblasting, abrasion with emory, and sliding contact were used to study the wear behavior of seven common metals. Data supports the theory that wear is roughly proportional to the inverse of the absolute melting point of the metal.

P. 97

THICK CLOSURES

How to Weld from One Side — In fabricating the pressure vessel for a nuclear test reactor, a method was developed to obtain a high quality weld from one side. It demands careful joint preparation and the use of a consumable weld insert.

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AUTOMATION

Gives Heavy Jobs a Lift — A vertical spindle borer fits into an automated setup producing 48 rail-

way car wheels per hour. The cast steel wheels come in four different sizes and weigh up to 700 lb each.

P. 104

PUNCHED TAPE CONTROLS

New Tape Transfer Line — Short or long runs can be handled with equal ease. Because each machining unit has its own tape control, parts can be intermixed on the line.

P. 106

FAST SCRAP-CHARGING

Boosts Openhearth Output — A 34-ft gondola car, taking the place of eight 15-ft buggies, reduces waste motion and speeds charging. An hour reduction in charging time brings a similar reduction in furnace heating time.

P. 110

MARKETS & PRICES

WAREHOUSE PRICING

Portland System — New system tried out in Portland applies net pricing to all sizes and grades. Customers like it, but it involves lots of paperwork. The idea may spread.

P. 60

NEXT WEEK

AREA DEVELOPMENT ISSUE

Picking a Plant Site — The errors many companies made in choosing a plant site during the past several years are now coming to light. Next week's survey report examines the facts and provides a guide for new plant location.

COMPANY FOR SALE: But not necessarily to the highest bidder. W. C. Denison, president, Denison Engineering Div., American Brake Shoe Co., explains the precautions he took in selling his company and why he took them.

P. 57

PLASTIC-ON-STEEL

New Era Begins — Pipe users are the first to try plastic and steel combinations. They're getting a big welcome from oil and chemical industries because of high resistance to corrosion.

P. 65

DEFENSE BUSINESS

How to Get It — West Coast survey shows why many small businesses don't go after defense business. It's often more trouble than it's worth. But you have to go after contracts, not wait for them.

P. 81

1958 TOOL SALES

May Top '57 Total — Despite a slow start, machine tool orders this year could gain considerable strength. This note of optimism is sounded by the president of the tool distributors assn.

P. 83

SIGNS OF SPRING

Construction Perking Up — Steel men have little to cheer about this week. Their overall order volume is still moving sideways at a low level. But construction products are inching up.

P. 137





**"B&W Tubing
helps me control costs..."**

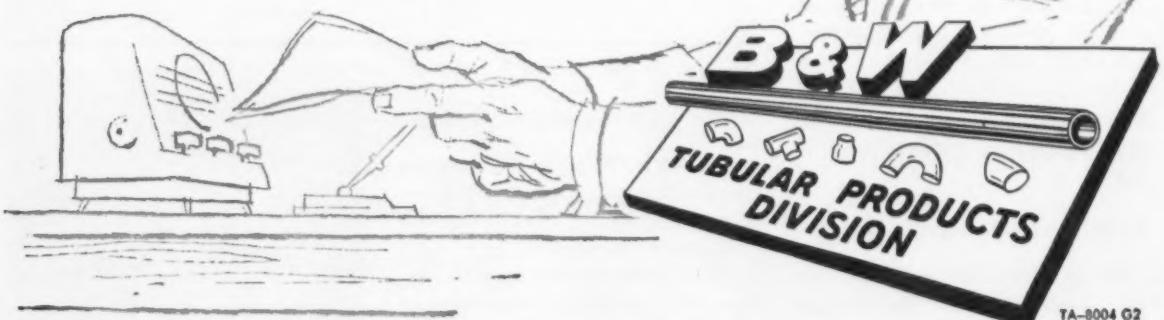
I'm a front office man. Keeping costs in line is my main job.

I know that B&W Tubing helps us build our products more economically by saving time and materials, minimizing rejects and fabricating problems."

Whatever your tubing job, B&W can save you money by tailoring physical and mechanical characteristics to suit your manufacturing methods exactly.

And B&W offers you a wide range of stainless, alloy and carbon steel tubing, in almost any size, shape or finish. What's more, delivery is fast, on schedule, in any quantity you need.

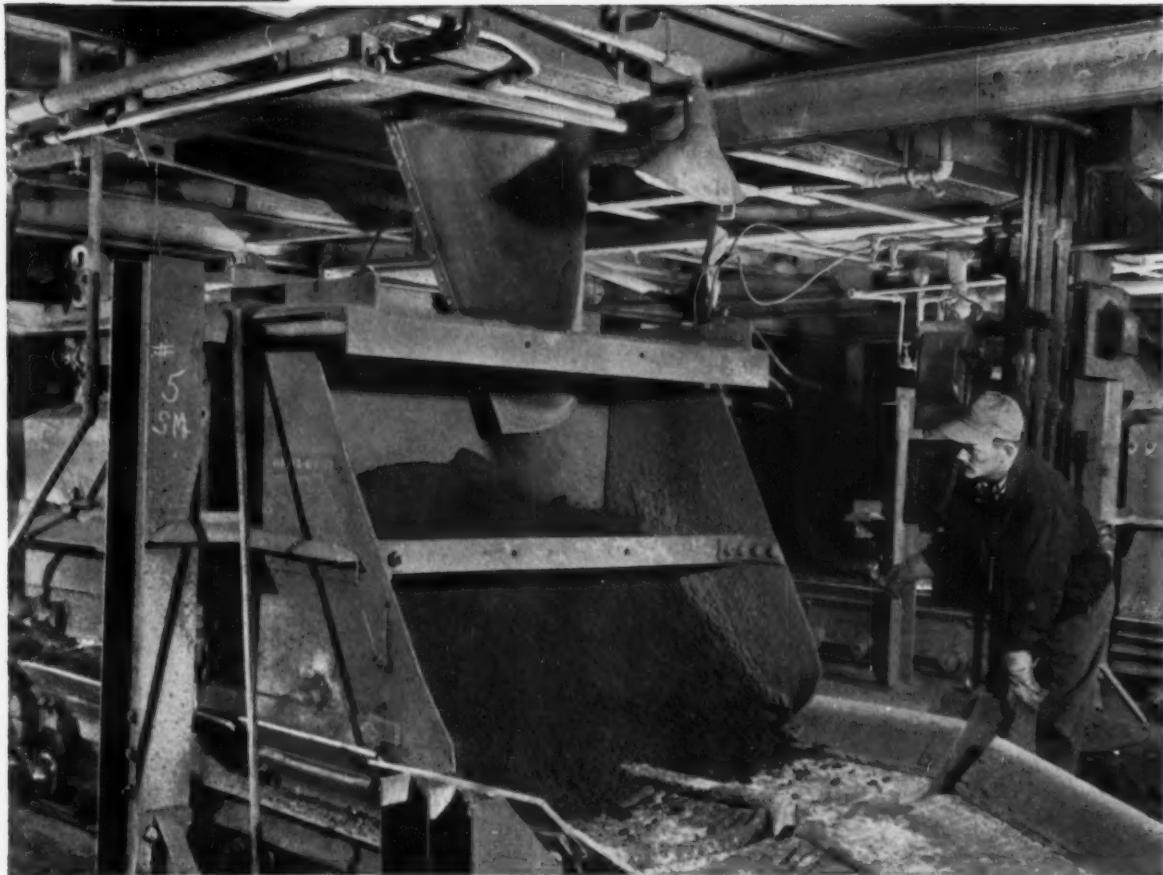
If you'd like to cut costs, and speed production, let B&W help you choose the best tubing for your special requirements. Get in touch with Mr. Tubes through your nearest B&W Representative or independent distributor. He maintains warehouse stock in principal cities. Or write for Bulletin TB-347. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.



TA-8004 G2

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals.

B.F.Goodrich



How rubber chutes save \$8000 to \$10,000 a year

B. F. Goodrich improvements in rubber brought extra savings

Problem: That black stuff pouring out of the chute was causing plenty of trouble in this zinc plant. It's a highly abrasive sinter mix—wet, hot, and so corrosive it would eat through metal. It was wearing out chutes, made from pieces of conveyor belting, in a few weeks.

What was done: When a B.F.Goodrich distributor heard about the problem, he recommended that the chutes be made with a special kind of B.F.Goodrich rubber sheeting, called Armorite, that's

especially compounded to stand terrific abrasion. This rubber is so tough, it's even used in some places to handle broken glass.

Savings: Plant men first estimated that the Armorite would last four to six times as long as the chutes previously used, and save \$8,000 to \$10,000 a year. Now they say it is lasting about 8 times as long. No more maintenance problems.

Extra benefits: B.F.Goodrich Armorite can be used in dozens of ways—as a

liner, curtain, throw mat or pad for protection against abrasives. Can be ordered with or without a reinforcing back of fabric, fibre or steel. It often lasts 10 times longer than steel; eliminating frequent, costly replacements of abrasion-worn metal parts.

Where to buy: Your B.F.Goodrich distributor has full information on Armorite. And, as a factory-trained specialist in rubber products, he can answer your questions about all the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-296, Akron 18, O.*

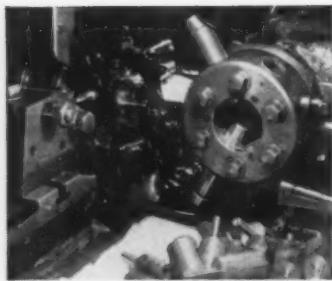
B.F.Goodrich industrial products

ANOTHER RYERSON PLUS: Cost-cutting ideas



Short, fast-breaking chips indicate machinability of Rycut 20
—also save time by eliminating problems of chip clearance.

Rycut 20 alloy steel increases rotor output 40%, doubles tool life



Using Rycut 20 bars, Buckeye Tools Corp. machines motor rotors in less than two minutes floor-to-floor time.

Here's a manufacturer getting 34 rotors an hour compared with a previous 24—plus a 100% reduction in tool grinding.

How? By switching to Rycut 20 alloy steel. The company is Buckeye Tools Corporation, of Dayton, Ohio. A Ryerson alloy specialist recommended Rycut 20 (a low-carbon, lead-bearing alloy) for the rotor of their "Cadet" nibbler, an air-operated contour-cutter used on sheet metal, tubing and plastics.

World's fastest machining alloy steel in its carbon range, Rycut 20 is widely used for gears, cams, spindles, shafts and bearings. Like all other alloys from Ryerson, it carries a Certificate of Analysis and Hardenability which tells you exactly what steel you're getting and what to expect of it. A phone call to a Ryerson steel specialist at your nearby Ryerson plant may bring important cost reductions in your metalworking operations.



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Courage to Withdraw

Some Will Need it Soon

Tension, anxiety and job-worry come mostly from the man—not from the job—that's what the experts say. Many jobs are proving grounds for the jitters but most men get by without personality damage—that's the gist of a recent study. [The IRON AGE, March 13, '58, P 75].

To the 25 percent who are more tension-laden, more prone to anxiety excesses and who often wish certain people would "drop dead", the admonition to take it easier hardly ever works.

What's worse, their jobs may be the very ones that accentuate personality troubles. But life being life they must keep up the old grind, fending off ulcers, bosses, and "tensions."

The current business picture suggests the most rugged kind of competitive action. So far our selling, planning, and running of our businesses and satisfying customers has been child's-play. What's ahead will be more than a test of what we have learned. It will call for new experiences—most of which will be learned the hard way.

What does this have to do with tensions, worries and personality difficulties? Only that during the past 10 years many people and businesses never had it so good. Older heads remember the 20's and the 30's. They know that what

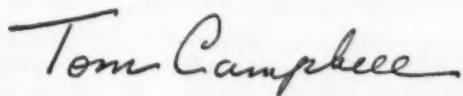
goes up must come down and what comes down eventually goes up.

The fellows who have yet to find out what competition really is, what running in the red means, and what taking a chance actually entails are in for some surprises. A fourth of them may not make the grade except at great expense to their physical and mental health. Many will be tied in knots, will accumulate ulcers or may crack up at the wrong time at the wrong place.

It is possible for the tension and anxiety-susceptible men to overcome their worst troubles. But they don't always see it that way. It depends upon what they want from life. If they subscribe to a work and worry compulsion that defies the laws of common sense there isn't too much hope.

One way to get a new lease on life for those who find it too tough—or not worth the price—to keep up a hated grind is to "give up" and take another job, one that won't produce ulcers or aggravate tensions. But that takes courage and runs against "the thing to do."

But less nerve-racking work will do the trick for those who honestly want to "reconstruct" their life—at least that's what the experts say, privately.

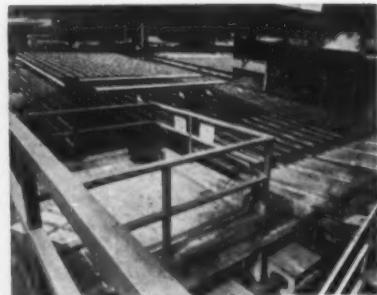


Editor-in-Chief

Treadwell



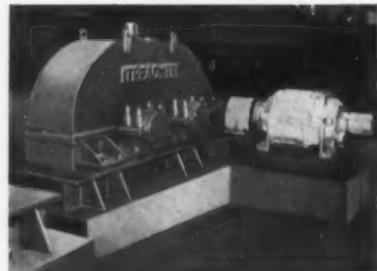
Courtesy Jones & Laughlin Steel Corp.



Bar and billet mill cooling beds capable of handling up to and including 5" square bars or billets up to and including 35' in length.

Beds are approximately 120' in length overall.

Bars or billets can be deposited on the beds alternately as fast as they are delivered from the mill.



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LETTERS FROM READERS

Ferrous Castings

Sir—The Feb. 13 issue of IRON AGE contained an excellent article on ferrous castings on p. 127 to 142.

We would very much appreciate receiving a reprint of this article. We are manufacturers' representatives serving the steel industry. We feel that this article is an excellent one and of value to those in the industry.—H. E. Johnson, Detroit.

Sir—We read with a great deal of interest your special feature article in The IRON AGE issue of Feb. 13, 1958, entitled "How to Get More for Your Castings Dollar." We believe this to be an outstanding article.

May we kindly request additional copies of this special feature up to a total of 100 copies. We are making a determined effort to distribute as many of the copies of this article to our ferrous castings users as possible.—R. A. Hipke, Sales Mgr. and Sec'y, Sivyer Steel Castings Co., Milwaukee.

Recession Cure

Sir—A lot of your space lately has been devoted to conjectures about how to beat the recession. There is a very simple remedy and a sure way of bringing back prosperity.

Let the government make the following statement: If the people will buy goods on credit for the next six months, we, the government, will pay one half of the cost. And then, watch business boom. The recession will be over with, in a hurry. Remember, anyone who lives within his income is messing up prosperity.—Prof. W. Trinks, Ohiopyle, Pa.

■ Nice to hear from you. Perhaps your solution would end the recession but how much more inflation would it produce?—Ed.

Belt Grinders

Sir—Your article in the Feb. 13 issue, p. 84, on belt grinders and polishing was very interesting.

Would it be possible for you to furnish us the names of the manufacturers or any one else whom we could contact for more detailed information?—G. C. Filiatral, The Stanton Steel Co., Center Line, Mich.

■ Manufacturers of the equipment are Hill Acme Co., Cleveland; Murray-Way Corp., Birmingham, Mich.; and Acme Mfg. Co., Detroit.—Ed.

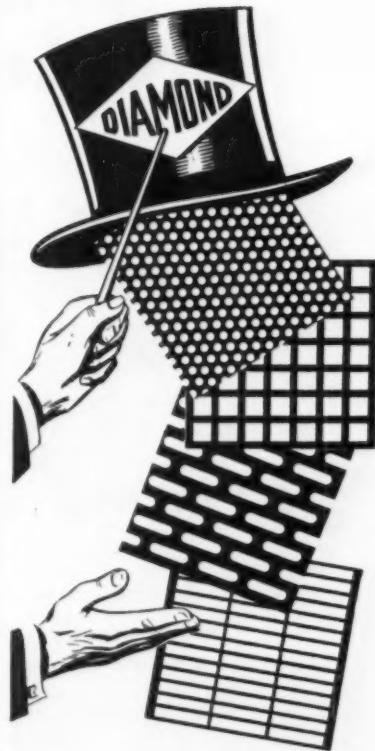
Market Survival

Sir—I would appreciate receiving five copies of your special report, "How to Survive in a Competitive Market," which appeared on p. 43 of your Feb. 20 issue.

We are especially sympathetic to Mr. Snyder's first point emphasizing the importance of "cutting out nonsensical auditing functions." No matter how lowly the manager, he is today being confronted with too many reports, most of which are no good.—O. W. Irwin, Pres., Rail Steel Bar Assn., Chicago.



"Dutch treat—You use your expense account and I'll use mine."

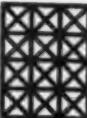
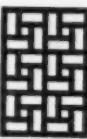


Top-Hat Quality IN Perforated Metal

The popular Diamond Perforated-metal patterns shown above are only a few of the many illustrated and described in our 32-page Catalog No. 39. All of these standard patterns are available in a wide range of unit-opening sizes and we are always equally pleased to quote on original designs of any type or size.

Catalog 39 also illustrates and describes our high-quality lines of Ornamental Cane, Perforated-Metal Sheets for Acoustical installations and Heavy-Duty Architectural Grilles. Write, today, for a free copy.

Correspondence is especially invited regarding ANY requirement for perforated-metal panels or parts. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.



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There is none
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DoALL Tool and Die Steel is precision-checked for a 25 micro-inch RMS finish or better.

Compare the Finish . . .
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Carbon . . . 1.00%	Carbon . . . 0.90%
Manganese . . . 0.50%	Manganese . . . 1.20%
Chromium . . . 5.00%	Silicon . . . 0.30%
Molybdenum . . . 1.25%	Tungsten . . . 0.50%
Vanadium . . . 0.30%	Chromium . . . 0.50%
	Vanadium . . . 0.20%



THIS IS A
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Here Is Surface Finish That **SAVES** You TIME and MONEY

No need to penalize yourself with the extra costs and troubles of surface-grinding your tool and die steel—when DoALL does it for you at no extra cost!

All DoALL precision-ground tool and die steel is checked for a 25 micro-inch RMS finish or better!

This job-ready finish can cut your tool, die, gage and fixture costs at least 15% by doing away with all surface-grinding at your end. No chance for grinding spoilage, either. No waste.

Having more than better surface finish, DoALL Tool and Die Steel also rewards you with precise dimensional accuracy. Size is accurate to $\pm .001$ thickness, $\pm .005$ -.000 width, with squareness edge to surface .003 per inch of thickness.

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- ✓ Heat-treating is simpler—it's non-

FREE GUIDE CHART GIVES 1576 STANDARD SIZES!

A valuable toolroom aid, complete listing of all standard sizes of air and oil hardening precision-ground DoALL Tool and Die Steels is conveniently given on this easily read wall chart. Send for yours now.



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TS-17

The **DoALL** Company

Des Plaines, Ill.

FATIGUE CRACKS

Early Starter

While we feel there's a lot worth digesting in IRON AGE, we don't recommend doing it by the method of this young lady.



Getting her teeth, whatever number she has, into your *ffj* is Miss Elinor Wright of Providence, R. I. Watching and waiting an opportunity to find what's doing in metalworking is her daddy, W. Redwood Wright.

Water Revisited

James A. Roemer, Board Chairman of Sharon Steel Corp., has a good memory. He proved it recently when he read an editorial in the Youngstown Ohio Vindicator about our growing water shortages.

Reader Roemer recalled that way back in May, 1950, IRON AGE Editor-in-Chief Tom Campbell had discussed the problem, then still largely unnoticed.

When Tom then labeled water needs as a future pitfall eight years ago he accurately predicted what has come to pass. In part his 1950 editorial read, "Now is the time to start telling your employees and the public that: You do know that water is a problem; that you are doing something about it; that water is an important item in making more

things for more people; and that you do not intend to waste it any more than you would waste your own machinery."

"Now is the time to prepare for what may someday become a cause celebre—with the politicians yelling to the high heavens that precious water is being wasted, misused, and that industry is to blame."

Look Ma, No Wheels

Detroit just won't rest on its achievements. We hear automotive designers are talking about a car of tomorrow which will have no wheels. Propelled by turbine-driven ducted fans it would glide along a few feet or even a hundred feet from the ground.

We'll pause while the interesting possibilities this presents are absorbed. Offhand, it looks like the end of the spare tire, the bumper jack, and the snow chain.

Now if someone will just invent a missile with wheels we can keep things in balance.

Genius at Work

Let none be deceived. You can't beat American mechanical ingenuity, even in the field of building illegal stills.

Police were lavish in their praise of one seized recently in Indiana Township, Pa. According to Steel Horizons News, publication of Allegheny Ludlum Steel Corp., the unit's heavy gage stainless steel casting resisted pistol bullets.

The still, which produced 60 gallons of illegal whiskey a day, practically duplicated in miniature the big distilling operations used by industry.

"A good mechanic set this up," said one police officer. "All copper tubing joints were welded and the still itself was made of stainless steel. It really looked like a professional job."

Atlas

PLANT-WIDE PROTECTION STOPS CORROSION!



ATLAS CORROSION-PROOF CEMENTS

... complete line of sulfur silicate and resin based cements for plant-wide use in constructing corrosion-proof tanks, floors, pits, trenches and sumps.

ATLAS CORROSION-PROOF TANK LININGS



... natural or synthetic rubber and asphaltic materials designed to meet specific corrosive conditions within your plant and installed at the job site or in Atlas shops.



ATLAS RIGID PLASTIC STRUCTURES

... corrosion-proof, self supporting polyvinyl chloride designed and fabricated for use as tanks, ducts and fume systems to meet your exact needs... plastic pipe systems to convey all your corrosives.

These products will give you permanent plant-wide protection against corrosives.

Write for Bulletin CC-3.

ATLAS
MINERAL
PROPRIETARY COMPANY
MERTZTOWN, PENNSYLVANIA



"WEIRZIN® ARRESTS CREEPING CORROSION,"

SAYS CHIEF ENGINEER OF GRAND SHEET METAL PRODUCTS COMPANY, MELROSE PARK, ILL.

"Especially designed to withstand wind, weather, fire and rough handling." That's the manufacturer's description of a Grand Handy House. Metal used? Weirzin.

But listen to what else Grand Sheet Metal Products Company has to say about Weirzin electrolytic zinc-coated steel, as used in their outdoor storage-shelter-utility Handy Houses. From Chief Engineer Edward Rawson:

"Weirzin material provides a very good surface for maximum paint adherence, which is most important for an outdoor application such as ours.

"High corrosion resistance is also of the utmost importance. Weirzin answers this requirement very well since it arrests any creeping of corrosion where the surface may become scratched or abraded in service. In other words, the corrosion will not tend to spread beyond the damaged area."

What about your products? Have you considered lately how they can be improved economically? Send for free brochure on Weirzin for both outdoor and indoor use. Write Weirton Steel Company, Department A-15, Weirton, West Virginia.



**WEIRTON STEEL
COMPANY**

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

COMING EXHIBITS

Packaging Machinery and Materials Show — March 25-28, Convention Hall, Atlantic City, N. J. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

Industrial Development Show — Apr. 7-11, Coliseum, New York. (Woods, Donegan & Co., Inc., 48 West 48th St., New York 36.)

Design Engineering Show — April 14-17, International Amphitheatre, Chicago. (Clapp & Poliak, 341 Madison Ave., New York 17.)

Welding Show — Apr. 14-18, Kiel Auditorium, St. Louis. (Banner & Greif, 369 Lexington Ave., New York 17.)

Powder Metallurgy Show — April 21-23, Sheraton Hotel, Philadelphia. (Metal Powder Assn., 420 Lexington Ave., New York 17.)

Tool Engineers Show — May 1-8, Convention Hall, Philadelphia. (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

Western Material Handling Show — May 8-10, Great Western Exhibit Center, Los Angeles. (Information: 2809 Sunset Blvd., Los Angeles 26.)

Southwestern Metal Show — May 12-16, State Fair Park, Dallas. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Foundry Show — May 19-23, Public Auditorium, Cleveland. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

MEETINGS

MARCH

American Hot Dip Galvanizers Assn., Inc. — Annual meeting, Mar. 27-28, Penn Sheraton Hotel, Pittsburgh. Society headquarters, 1806 First National Bank Bldg., Pittsburgh.

American Society for Metals, The Golden Gate Chapter — Western (Continued on P. 16)

When it comes to Superior Barrel-Finishing Equipment

only Speed-D-Burr gives you these... "dollar saving"

EXTRA FEATURES at No Extra Cost!



**Finger-tip
instant-action
Control with
VARI-SPEED
heavy-duty
MOTOR**

Low Voltage Electronic Control Panels used in Speed-D-Burr Barrel Finishing Equipment are conveniently located for easy, quick, effortless accessibility . . . no reaching, no fumbling, no accidents!

Starting may be instantaneous or delayed; manual or preset start-stop timer eliminates need for close time-cycle supervision. Accurate automatic timing — just set the time cycle and forget it! Positive-action variable speed control governs rpm of barrel as registered on a large easy-to-read tachometer. Safety reset switch prevents unexpected starting. Forward and Reverse jog switches allow easy barrel positioning. Motor, transformer, low voltage controls, overload protection and all other controls are completely enclosed to prevent saturation from water or other contaminants.

**You are paying for a complete machine
Be sure you get one!**

Check features and cost of unit delivered in your plant!

HINGED BARREL DOOR

Quick acting cam locks reduce opening and closing time by 90%. Prevents improper door replacement or accidental droppage.

GREATER BARREL CAPACITY IN ALL SIZES

Compared with the nearest competitive equipment the SPEED-D-BURR barrels offer 10 to 18% GREATER CAPACITY.

POSITIVE STATIC BRAKE

Gives smoother stopping with less wear and tear on equipment — thus practically eliminating maintenance costs.

STANDARD REPLACEMENT PARTS

Service and Parts available in all major areas

Service is our most important product . . . it does NOT cost — IT PAYS!

Write for Complete Short Form Catalog to Dept. IA-3

THE WORLD'S MOST COMPLETE LINE OF BARREL-FINISHING EQUIPMENT AND SUPPLIES

SPEED-D-BURR CORPORATION

3613 San Fernando Rd. • Glendale 4, Calif. • Chapman 5-2468

ALLIS-CHALMERS.



Products for steel: motors, m-g sets, control, pumps, Texrope drive equipment, crushers, mills, screens, rectifiers, transformers, substations, switchgear, circuit breakers, turbine-generators, voltage regulators, blowers, compressors, synchronous condensers, and water conditioning equipment.

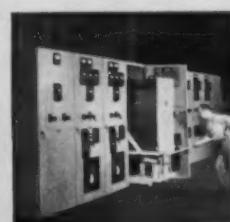
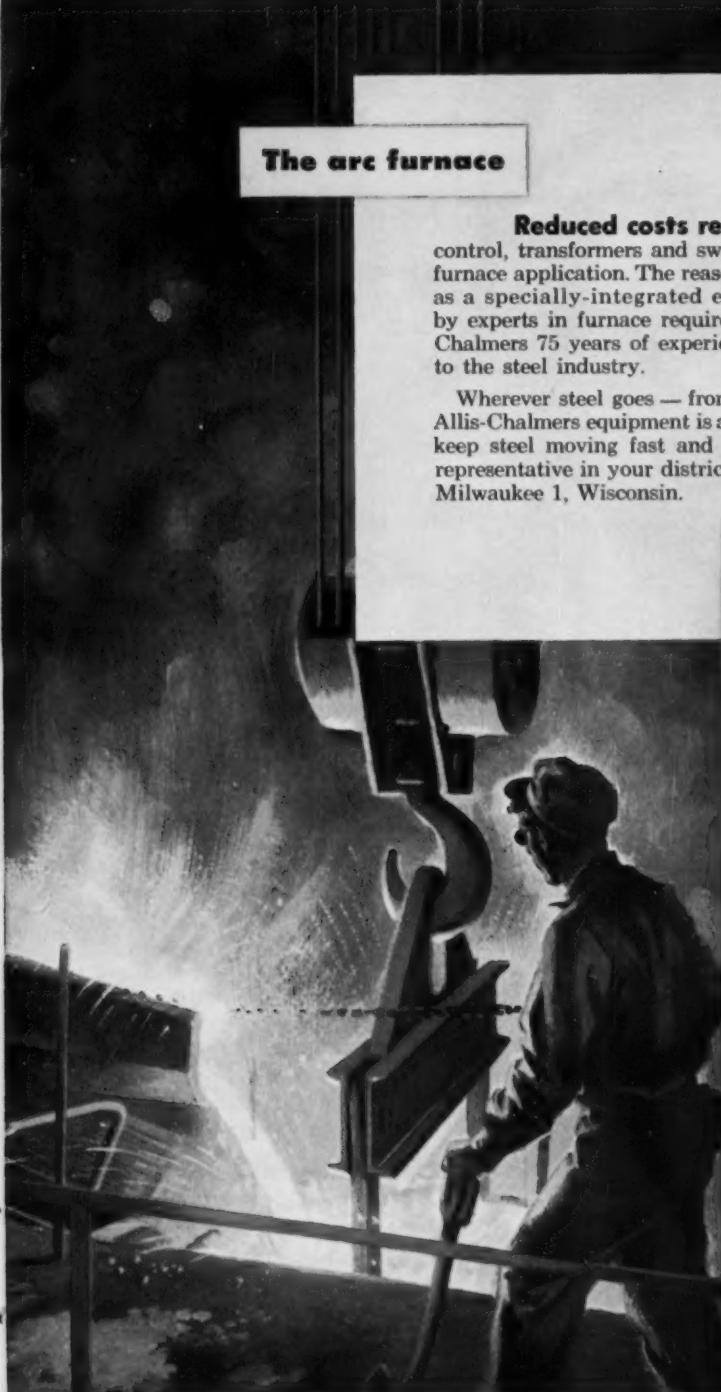
ALLIS-

... in Step with STEEL

The arc furnace

Reduced costs result when Allis-Chalmers control, transformers and switchgear are specified for arc furnace application. The reason: A-C offers these products as a specially-integrated electrical system — designed by experts in furnace requirements and backed by Allis-Chalmers 75 years of experience in supplying equipment to the steel industry.

Wherever steel goes — from mine to final processing — Allis-Chalmers equipment is available to keep quality high, keep steel moving fast and profitably. Contact the A-C representative in your district, or write to Allis-Chalmers, Milwaukee 1, Wisconsin.



Arc furnace switchgear
provides safe, dependable protection for transformer and related equipment. Special alloys assure long arcing contact life under severe interrupting duty, keeping maintenance and downtime to a minimum.



Transformers are of well-balanced designs and built for heavy duty . . . performance has been proven in 25-30 years of repeated daily short-circuits in electrical furnace operation.



... and **Control** requirements are met by Magnetic Amplifier and Regulux controls which balance arc current with arc voltage to maintain desired arc condition automatically. These controls result in high tonnage per kwhr, long life for electrodes and furnace linings, and a minimum of maintenance.

CHALMERS

Regulux and Texrope are Allis-Chalmers trademarks.



A-5363

the safe way to reduce
your tool inventory



make this your stockroom
for all fastening tools

There are more than 5,000 stock types and sizes of nut running tools in the Apex stockrooms . . . and almost as many types and sizes of screwdriving tools. Apex—the authority on fastening—can supply the tools you need, when you need them.

Prompt delivery can be made on standard tools . . . immediate attention is given to specials. For rush emergency orders, Apex representatives in many principal cities maintain sizable stocks of the most used fastening tools.

Want to see what's in "your fastening tool stockrooms"? Write, on your company letterhead please, for Catalog 29-R—Nut Running Tools; Catalog 21—Screwdriving Tools; or Catalog 25—Magnetic Fastening Tools.

1933 A Quarter Century of Service to Industry 1958

APEX

APEX TOOLS INC.
1029 S. Patterson Blvd.
Dayton 1, Ohio

TOOLS FOR
Screwdriving
nut running
FASTENING

EXHIBITS, MEETINGS

(Continued from P. 13)

welding, brazing and heat treating conference, March 27-28, Stanford Research Institute, Menlo Park, Calif. Information: Conference Sec'y—E. R. Babylon, Kaiser Steel Corp., 1924 Broadway, Oakland, Calif.

APRIL

Concrete Reinforcing Steel Institute—Annual meeting, Apr. 6-12, The Boca Raton Hotel, Boca Raton, Fla. Society headquarters, 39 S. Dearborn St., Chicago.

Wire Reinforcement Institute, Inc.—Annual spring meeting, Apr. 7-8, Hotel Boca Raton, Boca Raton, Fla. Society headquarters, National Press Bldg., Washington.

Industrial Fasteners Institute—Annual meeting, Apr. 8-10, Boca Raton Hotel, Boca Raton, Fla. Society headquarters, 1517 Terminal Tower, Cleveland.

Copper And Brass Warehouse Assn., Inc.—Annual convention, Apr. 13-16, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 1900 Arch St., Philadelphia.

Steel Shipping Container Institute—Annual meeting, Apr. 14-18, Kenilworth Hotel, Miami Beach, Fla. Society headquarters, 600 Fifth Ave., New York.

The American Zinc Institute—Annual meeting, Apr. 14-15, The Chase-Park Plaza Hotels, St. Louis, Mo. Society headquarters, 60 E. 42nd St., New York.

The Metallurgical Society of AIME—41st Openhearth steel and blast furnace, coke oven, and raw materials conference, Apr. 14-16, Statler Hotel, Cleveland. Society headquarters, 29 W. 39th St., New York.

Lead Industries Assn.—Annual meeting, Apr. 15-16, Chase-Park Plaza Hotels, St. Louis, Mo. Society headquarters, 60 E. 42nd St., New York.



Photo courtesy of The UPJOHN Company

Now! Snail's pace to top speed...no jars, no jolts!

Entirely new! The only electric fork truck that provides smooth, "non-jerk" power-delivery under *all* working conditions.

On the all-new Clarklift Electric an infinitely variable speed control provides the *exact* torque necessary for different working conditions and assignments. On ramps, in congested areas, and particularly when inching or stacking . . . power is delivered with perfect regulation. Your driver has *complete* control of the travel speed of his

truck at all times, resulting in greater efficiency and safety than ever before possible.

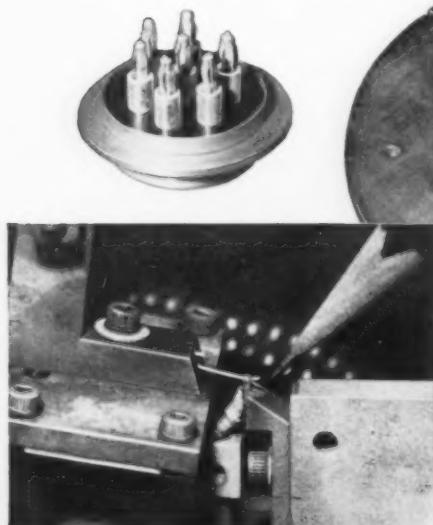
A new upright, one lever for both lift and tilt, self-adjusting brakes, unmatched accessibility are just some of the new features. There are many, many more. Send today for a brochure giving full details. Simply write: New Electrics, Clark Equipment Co., Battle Creek, Mich.

CLARK
EQUIPMENT

CLARKLIFT is a trademark of Clark Equipment Company

Titanium's corrosion resistance and low heat conductivity team up to...

DOUBLE SOLDERING PRODUCTION



All-titanium dip soldering jig developed and used by Astatic Corporation has advantage of low heat conductivity and corrosion resistance.

Titanium jig has excellent wear resistance, permits holding close tolerances when soldering phonograph needle assembly.

In handling a variety of soldering operations on small precision parts, Astatic Corporation—electronics manufacturer—has realized many benefits with Mallory-Sharon commercially pure titanium soldering fixtures:

- Corrosion resistance of the titanium fixtures to certain soldering fluxes is excellent. Thus service life is far longer than that of other metals previously used.

- Heat conductivity of titanium is low. Thus the fixture does not take heat away from the work, and the operation takes less time. On a typical assembly, use of the titanium fixture increased daily output from 1000 to 2500 parts per day.
- Titanium's excellent wear resistance, plus the fact that solder does not stick to titanium, allows very close tolerances to be maintained.

Assembly rejects were cut from 25% to less than 1%.

Can you use titanium's unique advantages? For information on properties and fabrication techniques ask for the booklet "Titanium Fact File". Write Mallory-Sharon Metals Corporation, Niles, Ohio. Mallory-Sharon produces titanium, zirconium, and other special metals in sheet, strip, rod, bar, plate and other standard shapes to meet your requirements.

Visit us at Booth 284,
Design Show, Chicago,
April 14-17.

MALLORY-SHARON

METALS CORPORATION • NILES, OHIO



Integrated producer of Titanium • Zirconium • Special Metals

An improved Combination Starter for extra safety

While the changes in the new Allen-Bradley Bulletin 712 and Bulletin 713 starters may be relatively minor, they were made in your interest—to give you the best control on the market.

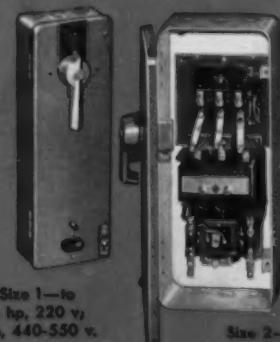
The new operating lever has been attractively restyled and structurally improved. Now the disconnect switch can be locked "open" or locked "closed"—with three padlocks of any kind. For the maintenance engineer, a concealed latch pin is built into the lever, which permits opening the door of the cabinet without opening the disconnect switch and stopping the motor. The door can also be padlocked shut independently of the operating lever.

With the disconnect lever in the "off" position, the cabinet door can be opened. At a glance, it can be seen that the movable contacts are open. An added "safety" feature—the incoming line connections are covered with an insulating plate to prevent accidental contact.

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

BULLETIN 712—These modern A-B combination starters cost no more than a separate starter and disconnect switch, and make a neater, safer, more attractive installation.



Size 1—to
7½ hp, 220 v;
10 hp, 440-550 v.

Size 2—to
15 hp, 220 v;
25 hp, 440-550 v.



Size 3—to
30 hp, 220 v;
50 hp, 440-550 v.

Size 4—to
50 hp, 220 v;
100 hp, 440-550 v.

Not only the Motor Starters, but the Accessories must be "Quality," too!



**we specify
ALLEN-BRADLEY
... all the way**

"Trouble" that shows up in a motor starter is often traced to a faulty operating auxiliary—such as a limit switch or even a push button station. Allen-Bradley builds the same high quality into its many accessories as it does into its motor starters—to give you millions of trouble free operations. They are also tested as thoroughly. Contacts are usually double break and always are of a silver alloy, which means they remain in perfect operating condition. It will pay you, too, to specify Allen-Bradley *Quality* control—"all the way!"



Bulletin 800T Oiltight Control Stations. Available in from one to sixteen units, in die cast aluminum enclosures.



Bulletin 802 Precision Limit Switch, with oiltight head and body.



Bulletin 805 Foot Switch. In rugged die cast enclosure for the toughest service.



Bulletin 837 Temperature Control with snap action, precision switch.



Bulletin 849 Pneumatic Timer. Reliable and accurate.



Bulletin 800T Oiltight Push Button, Selector Switch, and Press-to-Test Pilot Light.



Bulletin 800 Standard Duty Push Button. One, two, and three buttons; also as selector switch.

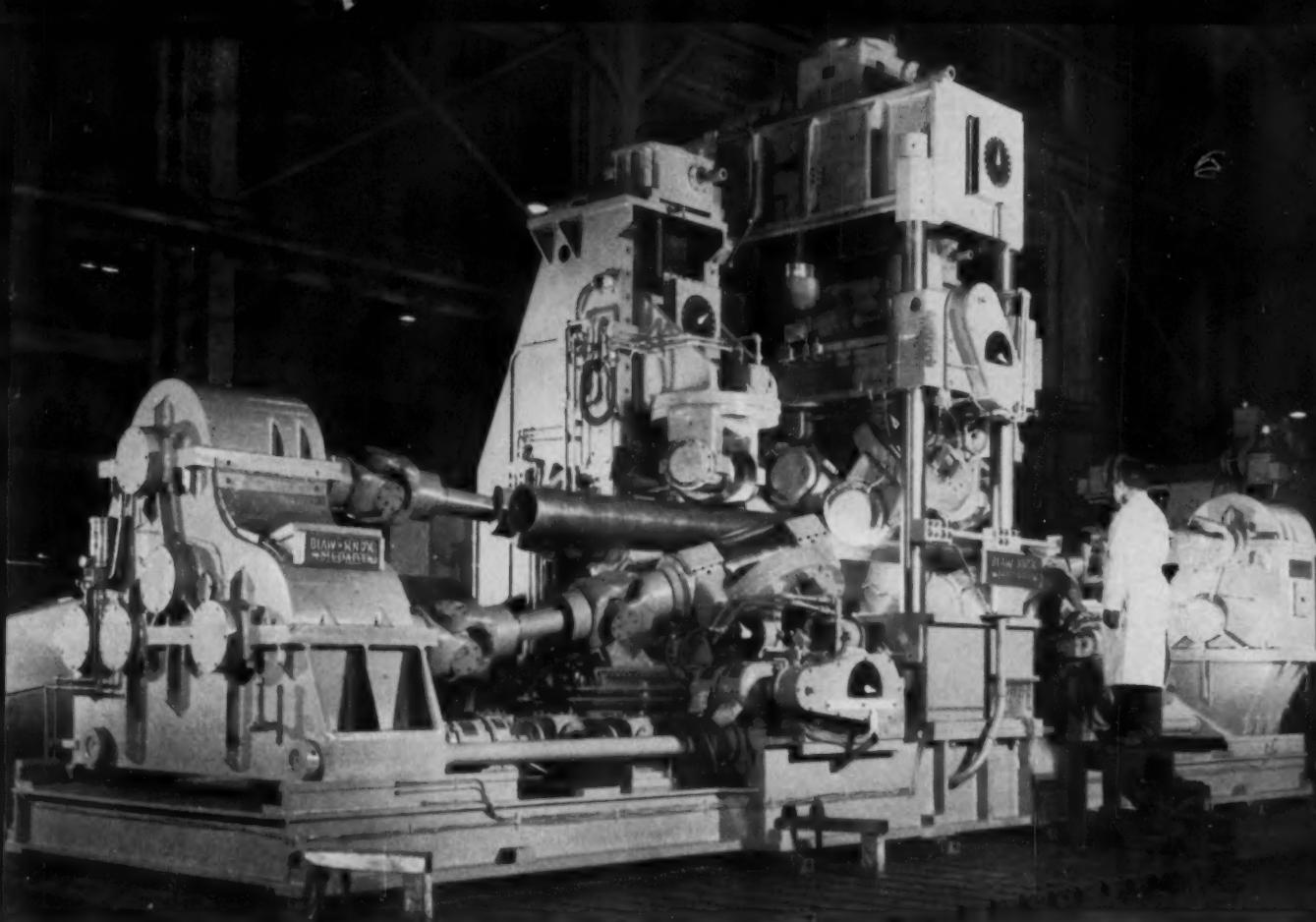


Bulletin 836 Pressure Control in NEMA 4 watertight enclosure.

3-58-MR

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL



Typical of latest Blaw-Knox Medart engineering developments is this patented, low stress 8-roll machine for straightening large diameter thin wall tubing or oil well casing up to 24" O.D.

BLAW-KNOX Medart gives you production line straightening for all Pipe and Tube applications

Blaw-Knox Medart offers the industry's most complete line of pipe and tube straightening equipment. Especially designed and built for today's high speed—high precision requirements, the wide range of these machines makes it possible to handle both steel and non-ferrous tubes and pipe, as well as solid rounds.

Typical of new design developments for high speed straightening is the Blaw-Knox Medart six roll multicycle arrangement in which all work rolls are driven to give a positive torque balance around the work piece. The single motor drive delivers a synchronized positive feed, and the sixth roll gives a double straightening cycle.

For special applications such as thin wall ex-

truded tubing or oil well casing, Blaw-Knox Medart offers a new line of low stress 8-roll machines. A patented arrangement of the roll clusters is responsible for keeping stress concentration in the tube wall to a minimum during straightening.

Whatever your pipe or tube application, whatever types of metals you process, there is a Blaw-Knox Medart straightener designed and built for high speed, precision work.

Standard equipment handles work diameters ranging from $\frac{3}{8}$ " to 24". Larger sizes for special applications will be designed on request. Contact us for detailed information, technical assistance or service.



BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Norton Pulpstones Prove...REPUBLIC COLD DRAWN BARS SHRUG OFF BRUTAL PUNISHMENT

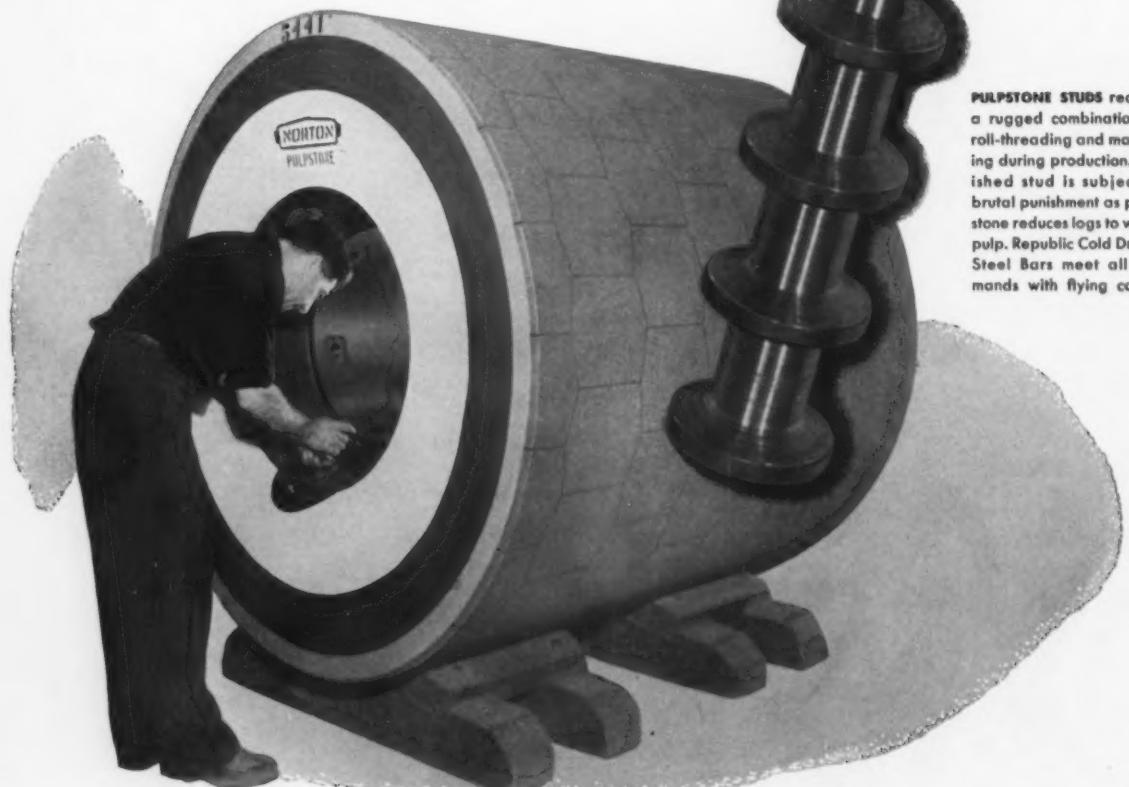
Chewing ton after ton of whole logs into pulp is all in a day's work for pulpstones manufactured by the Norton Company, Worcester, Massachusetts. Maximum reliability is a must in every component.

This is a major reason why Norton specifies Republic Cold Drawn Steel Bars for production of anchor studs to hold abrasive segments to concrete cylinder. Since cold drawn bars show marked physical improvement compared with the same analysis, hot rolled, they provide extra strength to absorb brutal in-service stress.

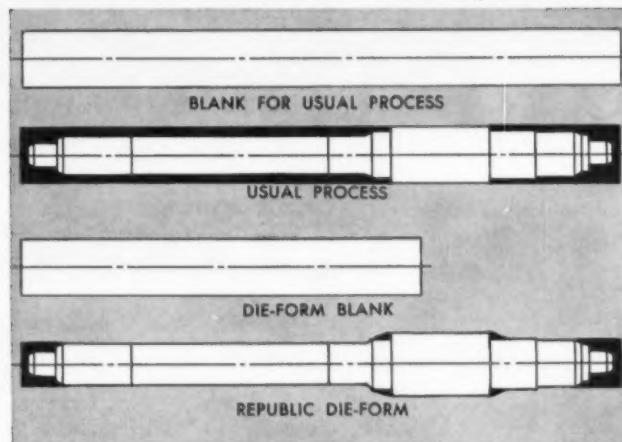
Beyond final product reliability, Republic Cold Drawn Steel Bars facilitate the severe forming combination of machining and roll-threading required in stud production. Finally, finished stud cost is far below the minimum made possible with former materials.

In addition to greater strength, hardness, and machinability which benefit the Norton Company, Republic Cold Finished Steel Bars provide both size and cross-sectional accuracy, smooth bright surface, absence of scale, and close tolerance straightness.

It will pay you to check these characteristics against your product and production requirements. For further information, contact your local Republic representative or mail coupon.

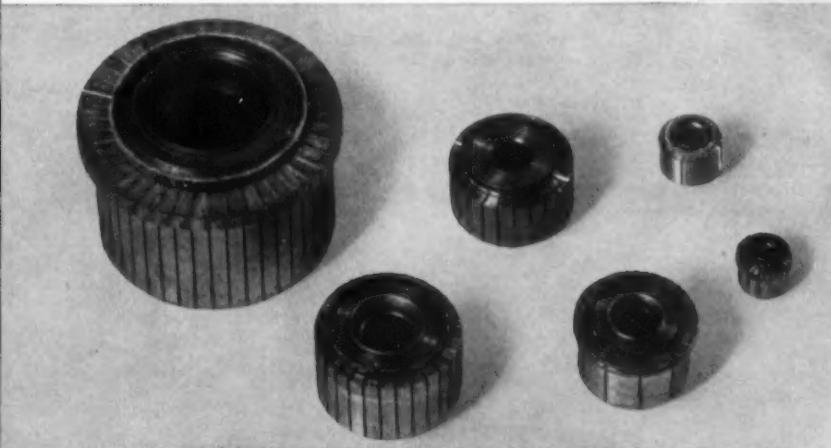
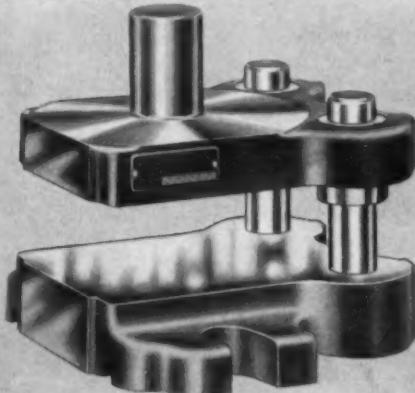


PULPSTONE STUDS require a rugged combination of roll-threading and machining during production. Finished stud is subject to brutal punishment as pulpstone reduces logs to wood pulp. Republic Cold Drawn Steel Bars meet all demands with flying colors.



METAL STAMPING PRODUCTION DEMANDS require both strength and accurate machining in die sets manufactured by the Union Manufacturing Company, New Britain, Connecticut. As a result, Union has standardized on Chateaugay, Republic's exclusive low phosphorus, copper-free pig iron for maximum strength, raw-free, easy-to-machine castings. Other superior characteristics of Chateaugay include its exceptional fluidity, even cooling, and fine dense grain structure. For complete information, clip and mail coupon.

INCREASED DEMANDS ON MANUFACTURING EFFICIENCY to meet shrinking profit margins require use of modern methods and materials. Republic Die Form is a good example of such progress. Die Form is a cold formed steel bar closely approximating the final multi-diameter part. Using a Die Form blank, you can make major savings in required machining and scrap loss. In the example shown above, 200 tons of Die Form blanks were used to produce parts formerly requiring 300 tons of conventional bar stock. Mail coupon for facts.



CLOSE TOLERANCE DEMANDS require that center holes in these electric motor commutators be virtually perfect to assure a proper press-fit on motor armatures. When ordinary steel was used for hubs, expensive pull broaches used to finish holes lasted for only 25,000 pieces. Several years ago, Han-Kor, Inc., Cleveland, Ohio, switched to Republic Cold Drawn Leaded Alloy Steel for hub manufacture. Since that time, no broaches have required replacement. Top machinability of Republic Cold Drawn Leaded Steels may help you save time and money. Send coupon for data.

REPUBLIC STEEL

*World's Widest Range
of Standard Steels and
Steel Products*



REPUBLIC STEEL CORPORATION
DEPT. IA - 5226
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send me more information on:

Cold Finished Steel Bars Chateaugay Pig Iron
 Cold Finished Leaded Steel Bars Die Form

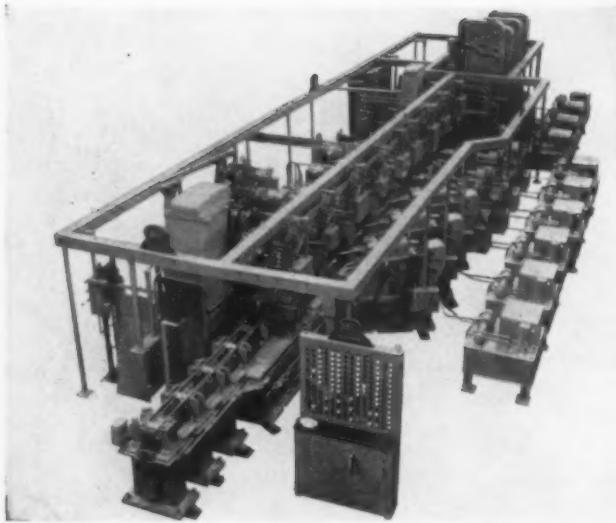
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Company _____

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City _____ Zone _____ State _____

Only Builds



**from
transfer
machines**

to small multi-spindles



**Somewhere
in Natco's experience is a
money-saving idea for you!**

Natco All Six

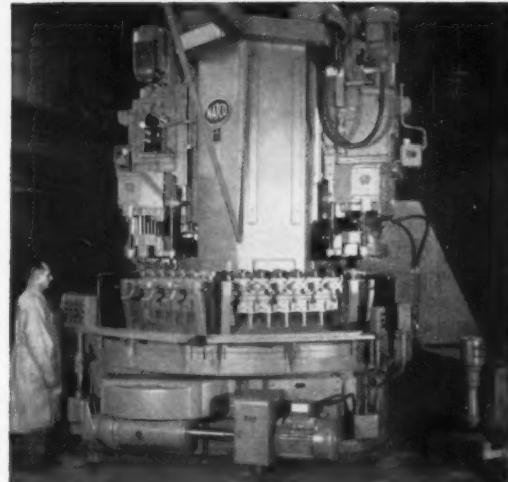
... and
everything
in between



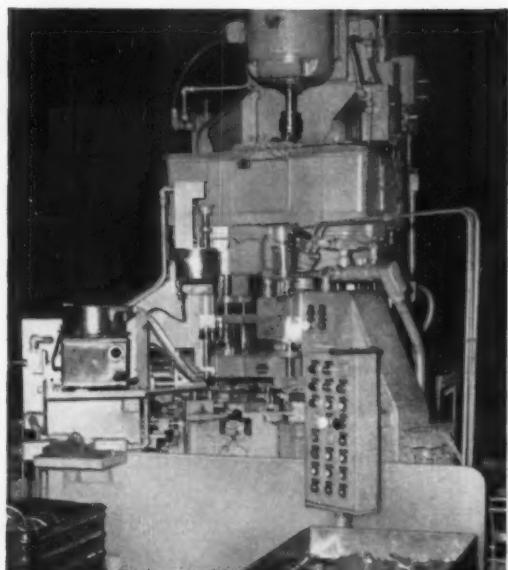
Drilling, boring, facing, tapping.

National Automatic Tool Company, Inc.,

Richmond, Indiana. Natco offices in Chicago, Detroit, New York, Buffalo, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.



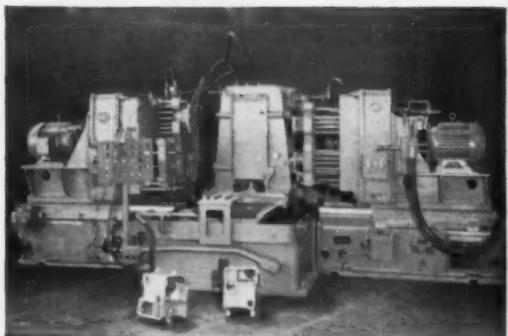
station



index

trunnion

way-type



Eastern's research, development and production facilities, devoted exclusively to stainless steel in sheets and plates, are available to you through the finest **distributor warehouse network** in the whole bright new world of stainless steel.

Your local steel service center offers prompt service, an opportunity to reduce your inventory, and quick delivery of in-stock materials.



Eastern Stainless Steel Corporation

Baltimore 3, Maryland, U.S.A.



ANATOMICAL DRAWING, courtesy of The MacMillan Company, "An Atlas of Human Anatomy" by Carl Toldt, M.D. © 1928

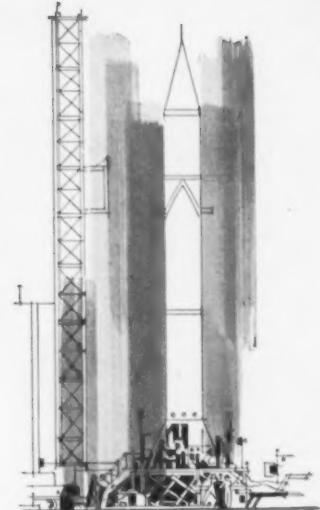


Quality...from start to finish!

Versatile ACIPCO Centrifugally Spun Tubes

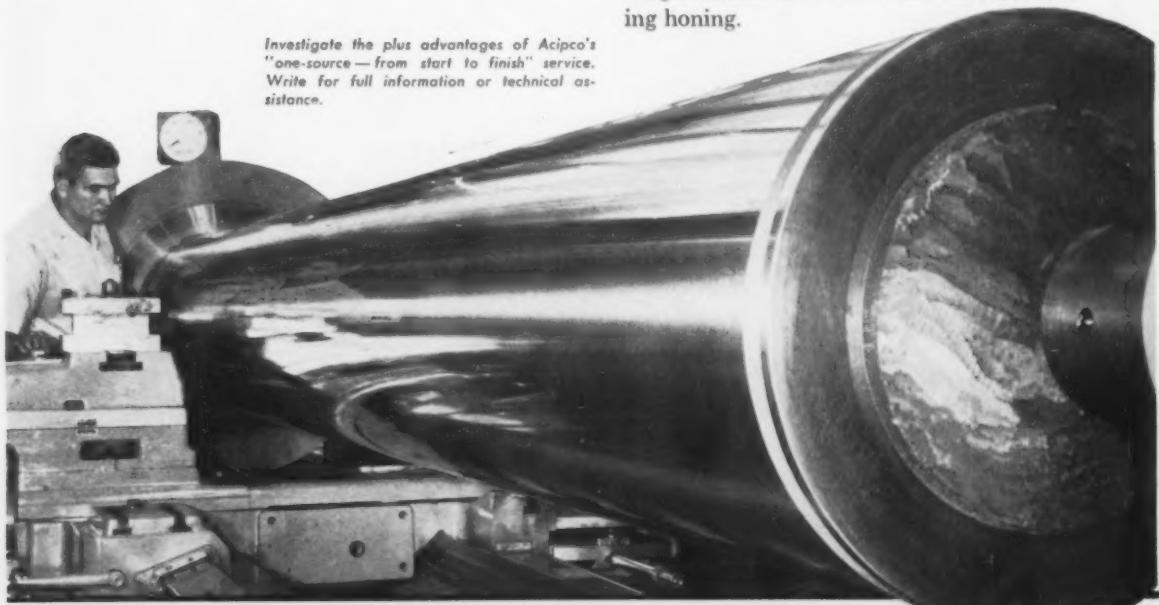
Look at that surface! Belt-polished to $\pm .0015"$ tolerance and 25 microinch finish, this 20' long, 26.25" OD, Type 4130 steel tube was produced at ACIPCO for use as a hydraulic cylinder plunger. This application graphically demonstrates the completeness of ACIPCO's extensive Machine Shop facilities.

ACIPCO can turn and finish up to 60" diameters and 41' lengths...hone up to 29" ID's and 16' lengths. Turning, honing and other related machining equipment occupy more than 100,000 square feet of modern Machine Shop construction.



ACIPCO tubes are available to you "Custom Spun" in lengths up to 16'... diameters up to 50"... and thicknesses up to 4". Welded assemblies can be supplied in any transportable length. ACIPCO produces standard and special analyses in steel and cast iron, including heat and corrosion resistant stainless steels. Tubes can be furnished as-cast, rough machined or finish machined, including honing.

Investigate the plus advantages of Acipco's "one-source — from start to finish" service. Write for full information or technical assistance.



A SPECIAL PRODUCTS DIVISION
AMERICAN
CAST IRON PIPE CO.
BIRMINGHAM 2, ALABAMA



MORE OF THE GARLOCK 2,000

**"If you're gasketing against steam
or gases to 700° F., try GARLOCK 900"**

Most engineers agree, that safe positive sealing of pipe flanges and gasketed joints on systems handling steam, gas, or air to 700° F. is best accomplished with a gasket material such as Garlock 900 which is resistant to plastic flow, but is compressible enough to compensate for surface irregularities. Garlock 900 is made from long fiber Canadian asbestos and a special rubber compound bonded under pressure and vulcanized into a homogeneous structure . . . compressible, yet resistant to plastic flow.

"...for hot oils use GARLOCK 7021"



Sealing against hot oils to 700° F. on pipe lines, internal combustion engines, compressors, or other high temperature applications calls for a strong dense gasketing such as Garlock 7021 . . . oil resistant, compressi-

ble, yet unusually resistant to plastic flow under heavy bolt loads.

"...for solvents to 300° F.—GARLOCK 7228"

This Compressed Asbestos and Neoprene Gasketing for gasketed joints and pumps, provides the desired compressibility necessary for safe gasketing on systems handling solvents or oils . . . without plastic flow under heavy bolt loads.

These high temperature gaskets are still another part of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. The only complete line. That's why you get unbiased recommendations from your Garlock representative. Call him or write for Gasket Folder AD 162.

THE GARLOCK PACKING COMPANY, Palmyra, N.Y.

For prompt service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

GARLOCK



*Packings, Gaskets, Oil Seals, Mechanical Seals,
Molded and Extruded Rubber, Plastic Products*



COLD

**THESE VERSON EXTRUSION PRESSES ARE PROVING DAILY
THE ECONOMICAL ADVANTAGES OF THE COLD EXTRUSION PROCESS**

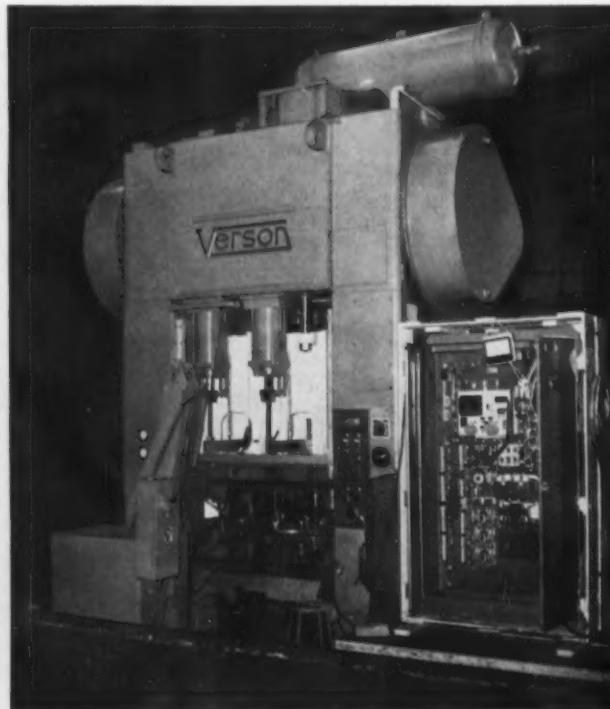


Above is a line of three identical 400 ton Verson extrusion presses producing the automotive valve tappet shown on the facing page. A close-up of the die space is shown at the right. All three presses are complete with cushion equipment, automatic feeds and dial type tooling. Each press operates at 30 SPM and produces two parts per stroke.

oo

A pioneer installation of two Verson extrusion presses rated at 1500 and 4500 tons respectively.

Successful operation on Verson extrusion presses in your plant is assured by tryout on production runs before shipment.



EXTRUSION...

it may be your best opportunity for improving your profit spread

In the intensive search for ways to hold materials and manufacturing costs down, cold extrusion has emerged as a major weapon. Scores of piece parts that formerly had to be machined from bar stock or hot forged, can now be extruded at a fraction of their previous cost. Scrap loss and the amount of machining necessary has been slashed.

This is no longer a theoretical concept. Verson cold extrusion lines have been in production for as long as three years. Since 1955 Verson has conducted a comprehensive Cold Extrusion Research

and Development Center in its Chicago plant for the purpose of developing and proving tooling and lubrication techniques.

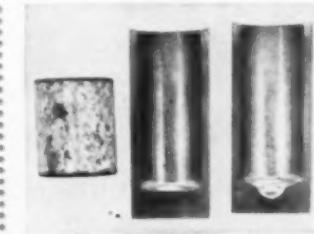
Out of this experience has come the cold extrusion know-how necessary to evaluate the adaptability of the process to your production requirements. With the ever-tightening squeeze on your profit margin, you can't afford *not* to investigate the cost-cutting possibilities of Verson Cold Extrusion. Get in touch with Verson, today. For recommendations, send an outline of your needs.

**A special report on Tooling for Cold Extrusion will
give you a better insight into what can be done with cold
extrusion. Write for your copy; there's no obligation.**

VERSON COLD EXTRUSION CAN REDUCE MATERIAL COSTS, CUT MACHINING COSTS ON JOBS LIKE THESE



Shown here in both exterior and cross section views is a propeller shaft end for an automotive drive shaft. It is made from AISI 1037 steel in two operations in 600 ton Verson extrusion presses. The part is $3\frac{1}{8}$ " in finished length and is produced at a rate of approximately 1200 per hour.



This is the automotive tappet produced in the presses shown at the upper left on the facing page. Shown are the slug and cross sections after first and second operations. After heat treating, finish grinding and drilling of an oil hole, the part is ready for installation.



This is a universal joint bearing race made in one operation on a 400 ton Verson extrusion press. The press operates at 30 strokes per minute, producing two of the $1\frac{1}{8}$ " x $\frac{3}{16}$ " parts per stroke from AISI-1018 steel.

A Verson Press
for every job from 60 tons up



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Vice President in charge of throwing money away

It's his job to get rid of the plant "waste." And very often in the most expensive way possible — by literally throwing it away.

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Here, at Handy & Harman, we have actual case histories in which impressive amounts of money in waste form were lost for years. That's why we've included this check list of various kinds of valuable waste. If your plant disposes of any of these materials (or similar ones), it will pay you to investigate Handy & Harman's refining service. Send a trial lot to the Handy & Harman refinery nearest you for accurate evaluation. We offer unsurpassed facilities and experience for complete recovery. If you're not sure of the value of waste you are throwing away, let us check a sample for you. You may discover an entirely new source of income. Write or call our Refining Division today.

CHECK LIST FOR REFININGS

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Gold Plating Solutions
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Gold Precipitates, Sludges & Sediments
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Gold Coated Copper Wire & Racks
Filter Pads
Silver Anode Ends
Silver Tank Scrapings

Production Operations

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Silver on Steel Bearings
Silver Steel Turnings
Silver Blanking Scrap, Stampings, Strip, Wire
Silver Grindings
Silver Copper Scrap
Silver Powder Mixtures
Silver Screen Scrap
Silver Solder Scrap
Silver Brazing Alloy Scrap
Silver Contact Scrap
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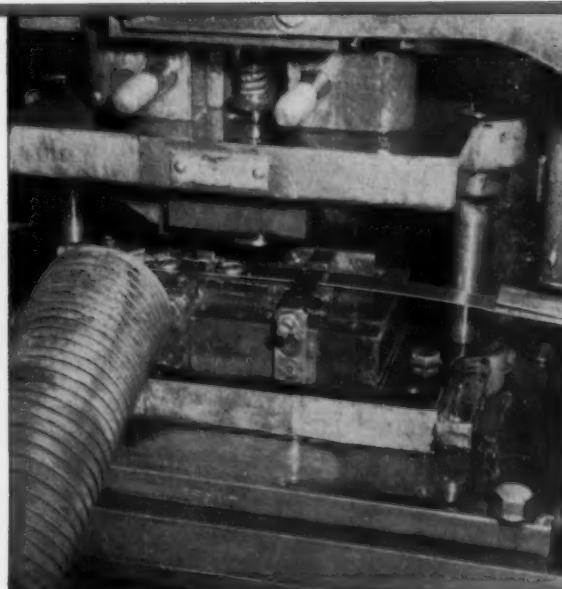
How Frantz Manufacturing Co. improves with these products: Amerstrip,



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roller skates and garage doors Amerled, and American Quality Springs



American Steel & Wire
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AMERSTRIP is used in the manufacture of almost every part of the 15 types of Hustler Corporation skates made by Frantz. These skates will stand up under the punishing wear children may give them—yet maintain their attractive finish. Amerstrip is tailored to each particular job . . . has the physical properties to assure a good performance and efficient manufacture.

Tough, durable American Quality Springs play a major part in the smooth operation of Frantz garage doors. These quality springs make garage doors lower in cost and easier to operate than doors using counterweights—and they have proven equally durable.

Amerled ups machining speed 17.4%

Frantz has been machining its own axles and bearing cones for roller skates and conveyor wheels. Recently they switched to Grade "A" free-machining USS Amerled. This easy-to-machine, lead-bearing steel meets all their requirements at lower cost as it permits them to increase machining speed from 320 to 375 S.F.M.—a 17.4% jump—with no loss in tool life . . . and less rejects.

American Steel & Wire produces a complete line of manufacturers wire products. Our large technical staff can tailor these items to fit your individual needs. Call our nearest Sales Office today. American Steel & Wire, General Offices, Rockefeller Building, Cleveland 13, Ohio.

Precision. In the top picture, wheels are being added to roller skates at Frantz's final assembly table. In the bottom picture, a Bliss Roll Feed Punch Press is stamping ball races from 1 1/4" .047 USS Amerstrip at the rate of 195 per minute. Frantz also makes heels, toes, and channels from Amerstrip.

USS, American, Amerstrip and Amerled are registered trademarks



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Leonardo Da Vinci's design for a pump using the Archimedean screw principle

Model courtesy of IBM

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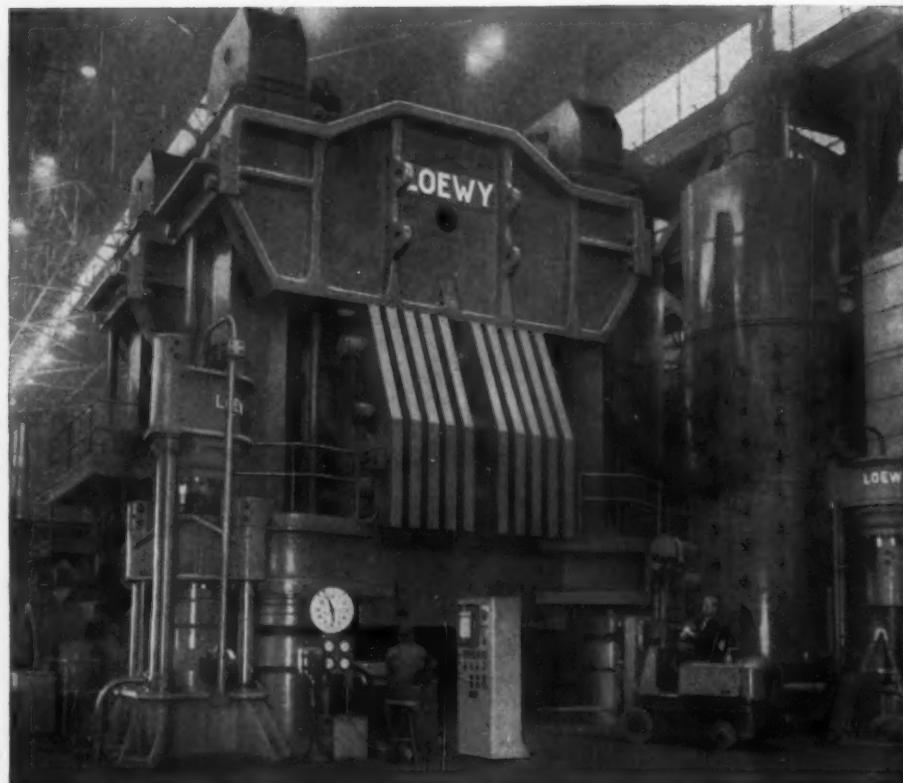
Can you automatically control speeds from 1/4 in./min. to 50 in./min. on your water-hydraulic press?

With Loewy's
new
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program
speed control
you can

Structural and machine parts in aircraft, missiles and nuclear apparatus today demand greater strength and resistance to high temperatures, and many have extremely thin areas. Machining and other metal removing processes are not economical, due to the high cost of labor, waste of expensive alloy material, and loss of structural strength from cutting across the flow lines of metal. New metals, new methods and new equipment are needed for the economical production of parts that will consistently meet the severest requirements.

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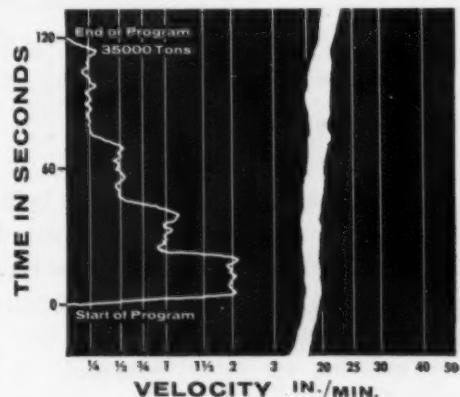
To solve the problems of automatically controlling water-actuated hydraulic presses, Loewy-Hydropress had to bring to bear not only its resources in metallurgy and process engineering, but also its unique facilities in design of electronic controls.



One of the largest presses in existence, this closed die forging press designed and built by Loewy, and in operation at the Wyman Gordon plant, North Grafton, Mass., features automatic program speed control.

The result is equipment which programs the change of speed and pressing force at preselected positions of the press stroke in existing installations. This makes it possible to translate experience in the production of high-quality metal parts into automatic repeat performance on any size hydraulic presses, including even the largest water-actuated presses, where such control was before unthinkable. Also it limits the maximum pressing force to a preset value and thus protects the tooling against overload.

For detailed information on the plastic forming of metals and on automatic controls for any machine process, write us today, Dept. A-3.



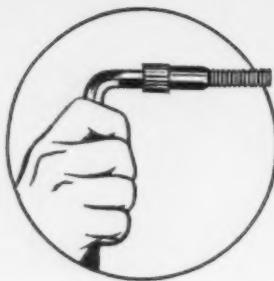
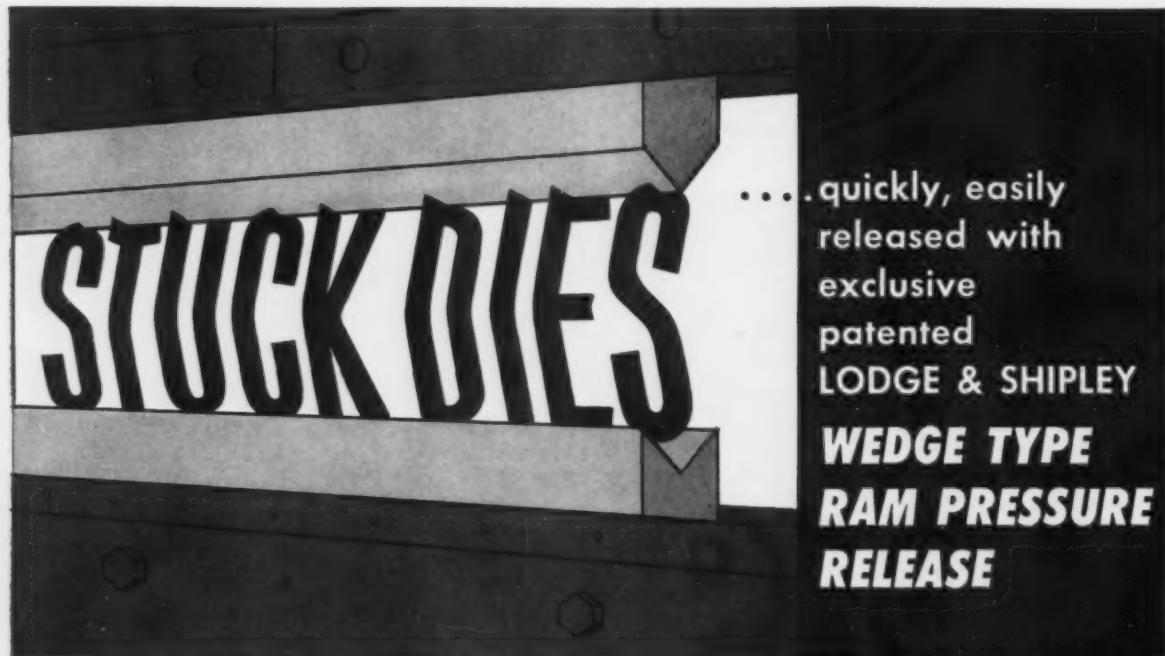
Graph shows a typical automatic control cycle consisting of four preselected speeds at preselected stroke positions up to 2 in./min. The workpiece is a 60-in. diameter steel billet. Pressure ranges from 6000 to 35,000 tons. Speeds range from 1/4 in./min. to 2 in./min. and total pressing time is 2 minutes.

Loewy-Hydropress Division

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- Use wrench not a cutting torch
- in minutes instead of hours
- without damage die holder destroyed

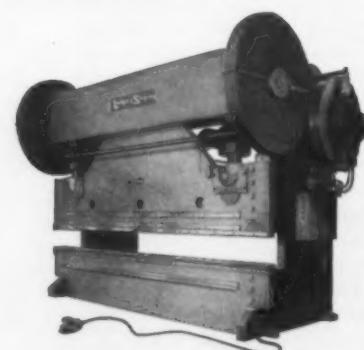
When a press brake is stalled due to improperly adjusted dies . . . do you face a short delay or near disaster?

With a Lodge & Shipley Press Brake, release of the stuck dies is a quick, simple, non-destructive matter as described in the accompanying detail.

This is but one of many outstanding Lodge & Shipley Press Brake features designed for fast, accurate, efficient and dependable press brake operation. New literature gives complete details. Write: **The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio.**



The Lodge & Shipley Wedge Type Ram Pressure Release is unusually simple and rugged in design. A heavy steel wedge has a top angle that complements a similar angle on the base of the ram pitman socket housing. Held securely by a heavy steel plate, the wedges can be released quickly to provide up to $\frac{1}{4}$ " additional clearance.



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finishing wheel

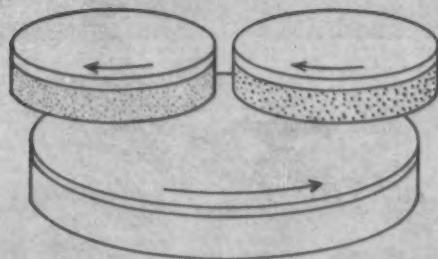
roughing wheel

Gardner abrasives double production in both rough and finish grinding

... greater wheel life due to improved
combination of grade and grain

Workpiece.....	water pump housing
Rough grind.....	23,000 parts per disc
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Specifications for Gardner abrasives are written by
men who are thoroughly experienced in both abra-
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GARDNER
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Beloit, Wisconsin

First Stainless Steel Auto

STILL BRIGHT AFTER



More than a quarter-century ago, pioneer automaker Henry Ford recognized the advantages of stainless steel for automotive trim. And here's evidence of his sound judgment. After 27 years, the stainless trim on this 1930 Model A

is bright and rust-free. More than 6 different parts on this model are stainless—radiator trim, head lamps, tail lamps, cowl strip, hub caps, gas tank cap, and other bright work.

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ARMCO STEEL CORPORATION • 1728 CURTIS STREET, MIDDLETOWN, OHIO
SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Trim Ever Used

27 YEARS

A few pounds of trim on this 1930 Model A Ford represent the first automotive use of stainless steel. Today it's still bright and shiny. It's free of corrosion too—a convincing demonstration of the reason why automakers in 1957 used more than 110,000 tons of stainless steels!

Customers see for themselves that stainless steels stay bright and beautiful—that stainless fights rust, chemical corrosion, heat, stress, and wear. Little wonder that parts made of Armco Stainless Steels do such a powerful selling job in so many products.

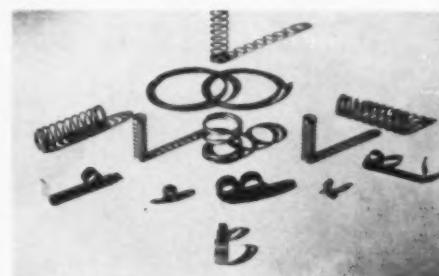
They offer *proved* sales appeal, not only in attractive consumer products, but in industrial and commercial equipment that works hard and long. Here the superior strength, endurance, and low maintenance of Armco Stainless really pay off in low cost per year of service.

Armco Stainless Steels are available in sheet, strip, plate, billets, bar, and wire; in many grades, standard and special; in a multitude of conditions, gages, sizes, forms, and finishes. Why not get the full story about high-quality Armco Stainless Steels? Just fill in and mail the coupon, or call your nearby Armco Sales Office or Armco Stainless Distributor.

Other Armco Steels for top-quality products include ALUMINIZED STEEL, ZINCGRIP®, ZINCGRIP PAINTGRIP®, Cold-Rolled PAINTGRIP, ENAMELING IRON, Welded Steel Tubing, Electrical Steels, High Strength Steels, Long Ternes, and high-quality Hot- and Cold-Rolled Steels.



Chemical processors make wide use of Armco Stainless Steels to resist corrosive chemicals and to guard product purity.



Special Armco Stainless Steels help solve many performance and fabrication problems. These springs, for example, are made from Armco 17-7 PH. This unique precipitation hardening stainless steel offers superior spring properties combined with ease of fabrication.



The manufacturer of these bright bus stanchion fittings uses Armco 17 Ti (Type 430 Ti) Stainless. For many applications, this chromium grade offers substantial savings over chromium-nickel types.

Armco Steel Corporation

1728 Curtis Street, Middletown, Ohio

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Acme Steel Strapping protects pipe shipments

PACIFIC STATES CAST IRON PIPE CO., PROVO, UTAH, wanted to improve arrival condition of cast iron pressure pipe shipped in gondola cars. So they called in their Acme Idea Man.

Together, they arrived at a bracing method using heavy-duty Acme Steel Strapping that virtually eliminated in-transit damage (Idea No. U3-2). Lengths of lumber are placed on the sides and bottom of a gondola car and four lengths of strapping are laid in position. Pipe is loaded and strap is tensioned and sealed, resulting in two secure units.

Now pipe arrives in damage-free condition and is faster to unload since orderly lading presents no unusual materials handling problems or hazards for consignee personnel.

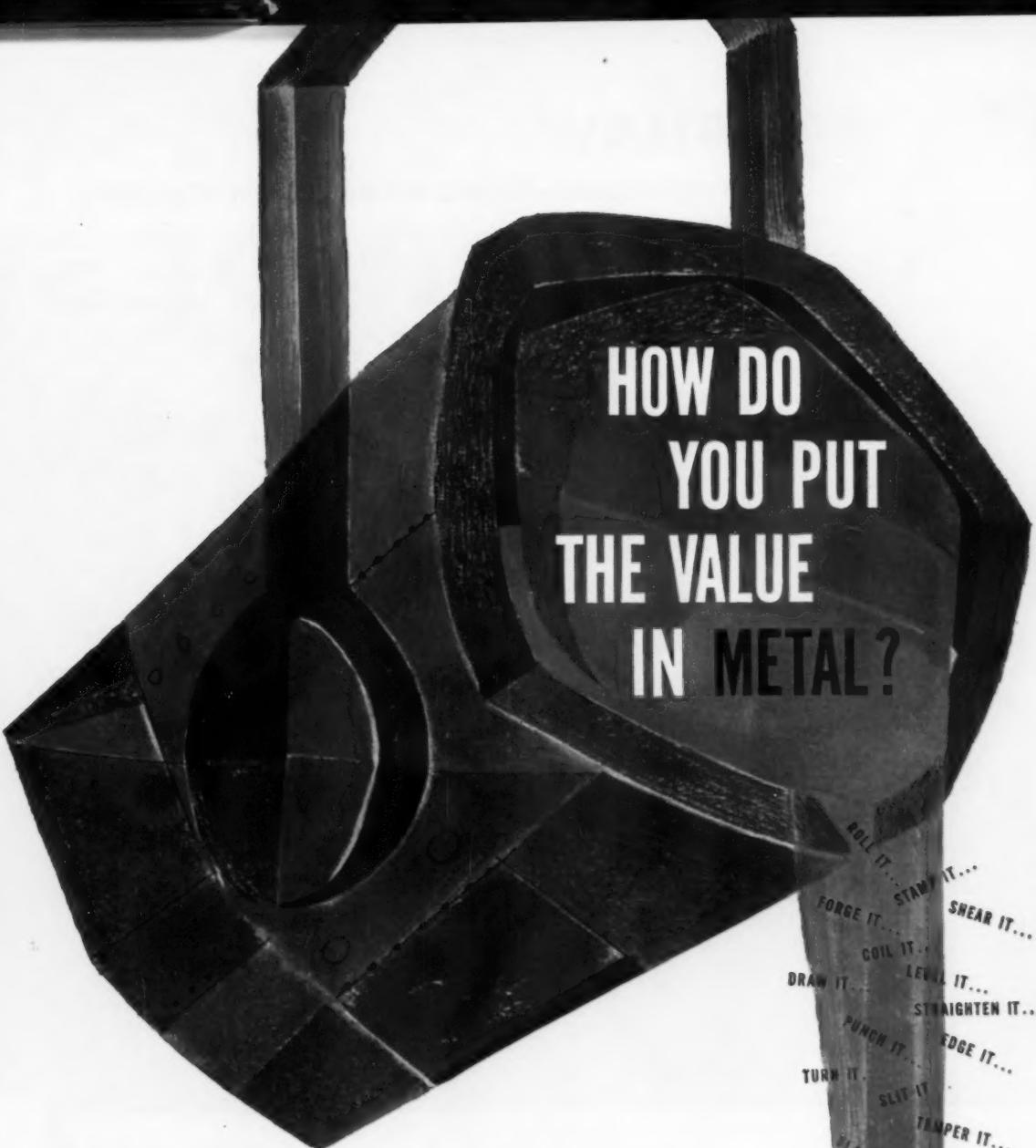
*Call your Acme Idea Man. He has scores of time-saving, product-protecting ideas, many of which may help you. Write Dept. IFU-38, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

Wayne Dabb works with Pacific States Cast Iron Pipe Co. to solve their product protection problems.



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Metallic Fluoborates
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Potassium Chromium Fluoride
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Stainless Steel
polishing information:



***Play it cool and don't press**

You can polish **Stainless Steel** to a mirror finish but you can't rush the job. Too coarse a grit, too much speed, too much pressure might scorch or discolor Stainless because steels of this family are not rapid heat conductors.

Use light pressure on the polishing agent, and remember that you can't get a desired finish any faster just because you press harder. Take your time. This

is by way of saying that Stainless Steel isn't difficult to fabricate, it's just different.

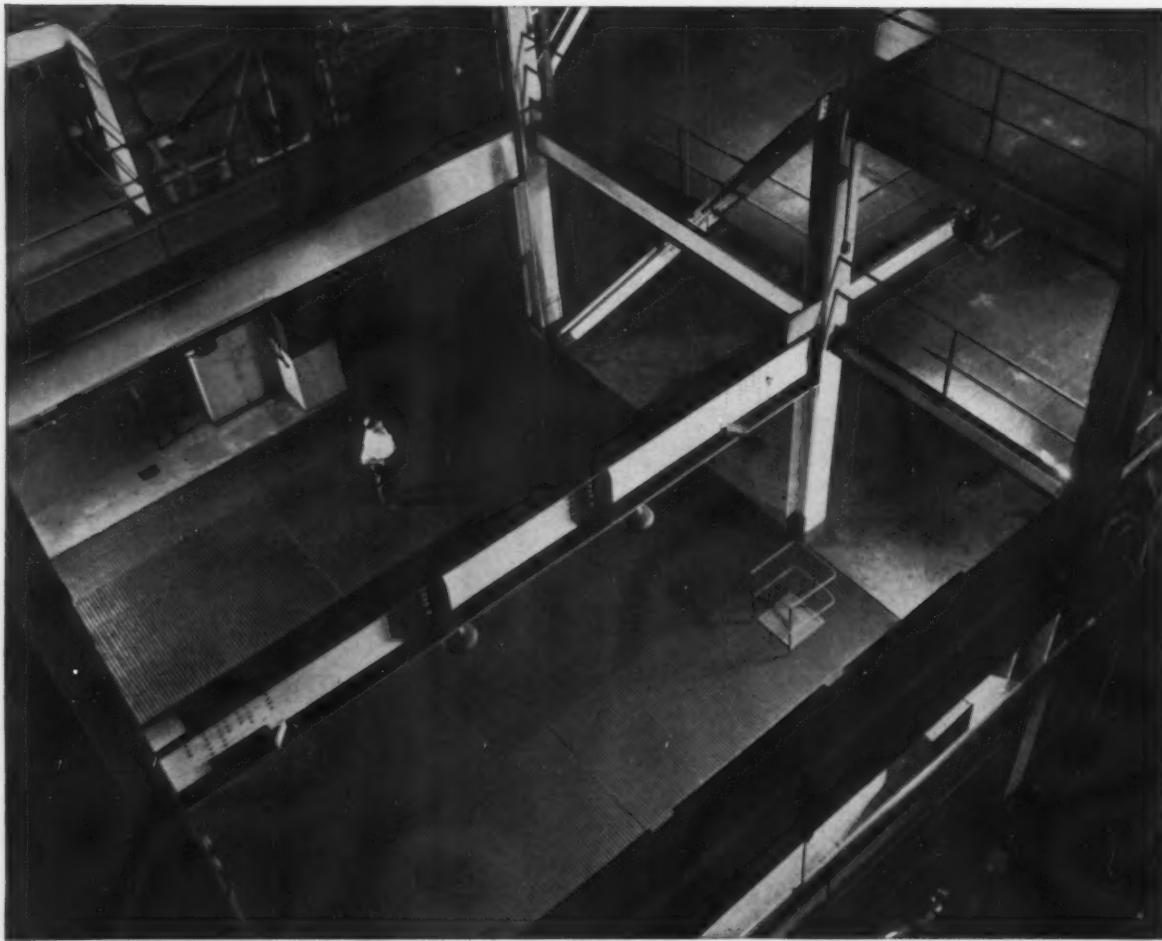
All your work on Stainless will be expert if you follow the "Stainless Steel Fabrication Book." If you don't have a copy, we'll be glad to send you one. Write on your company letterhead to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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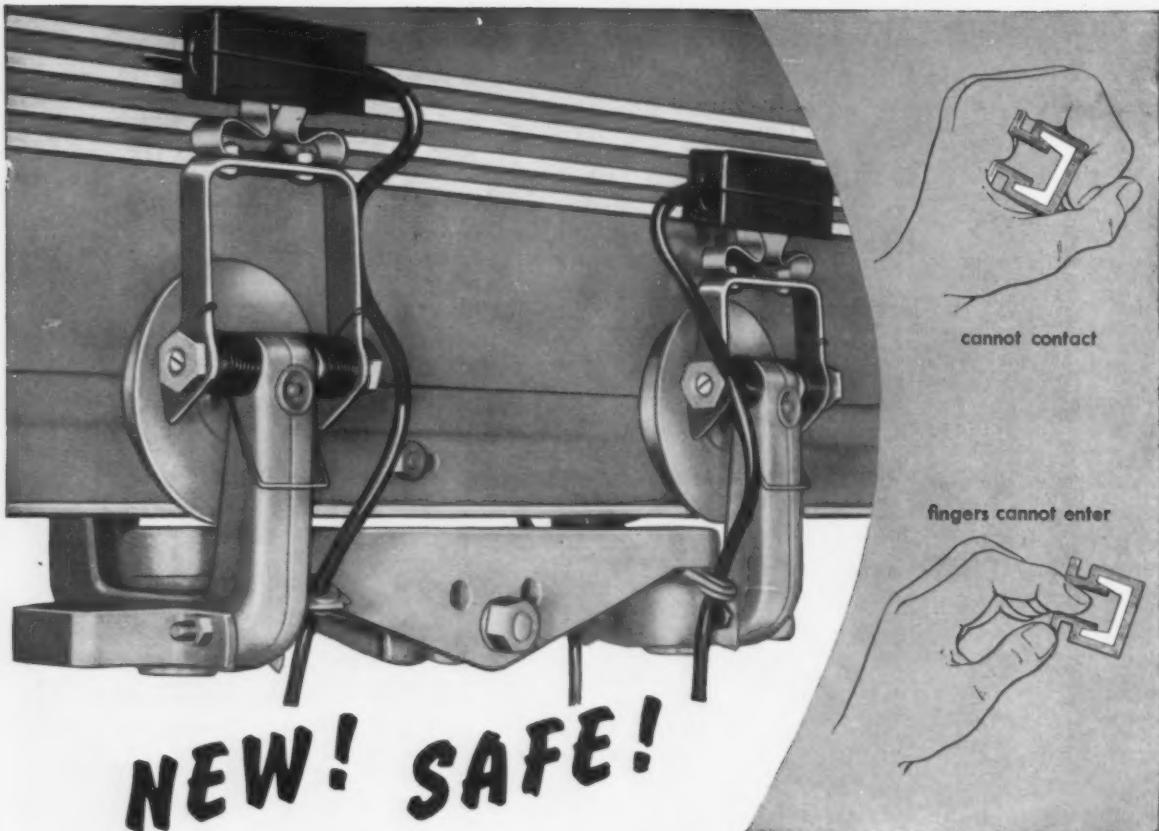
Brainard tube is available in sizes from $\frac{1}{2}$ " to 4", in gauges from .028 to .120. Also available in squares, rectangles and special shapes.

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Brainard's full line of steel tubing
send for this all new catalogue
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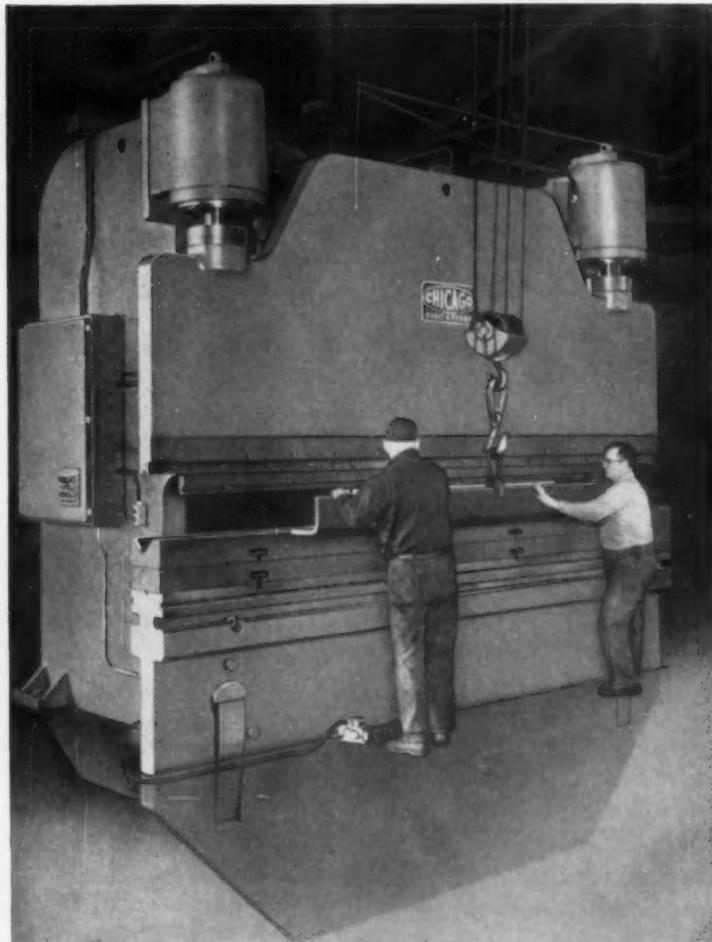
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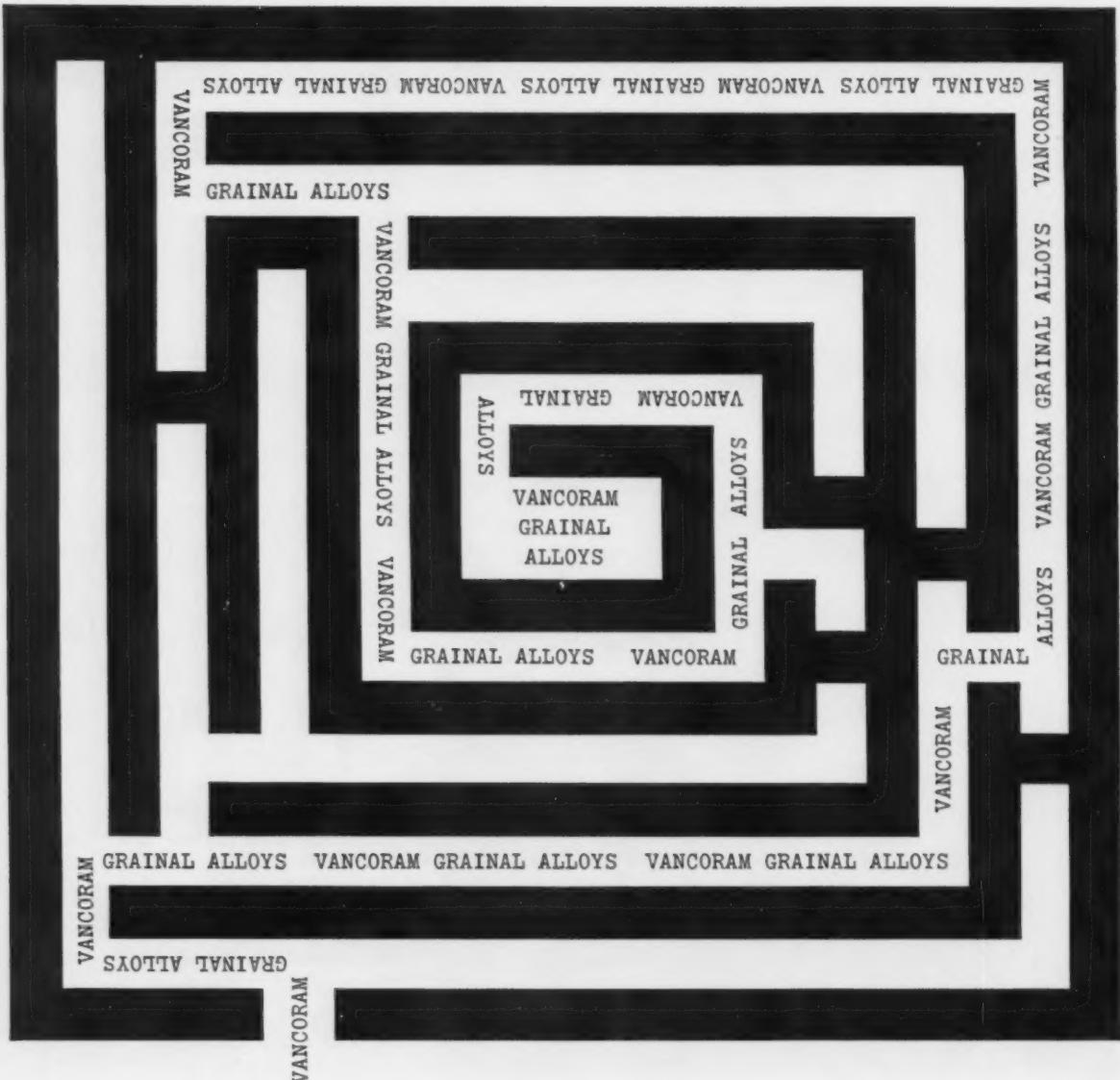
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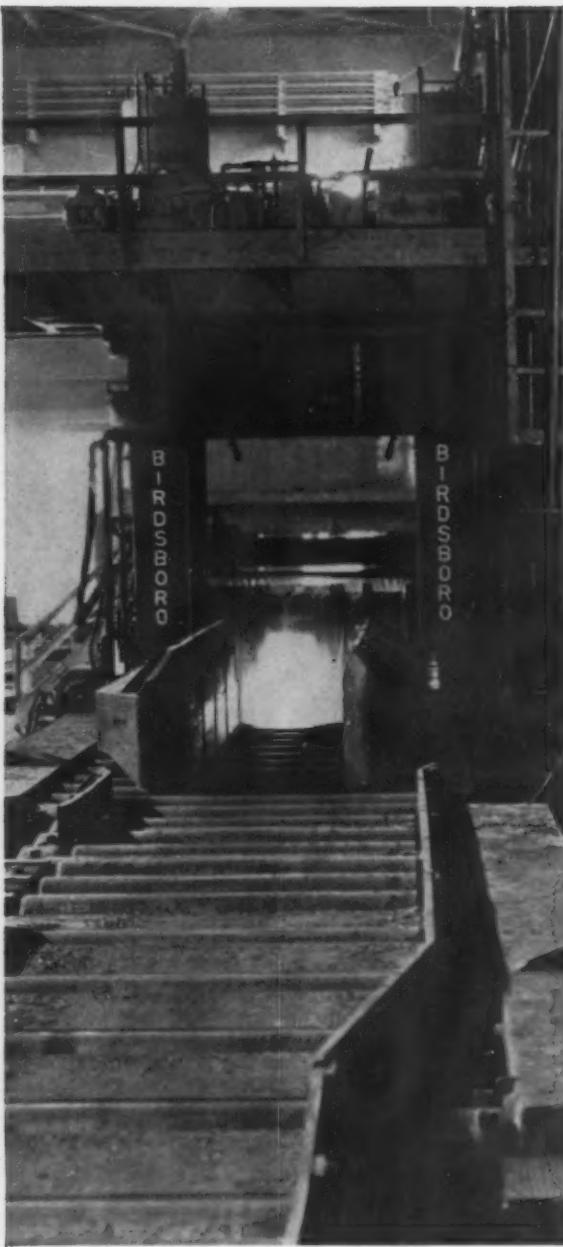
Birth of A 20 Ton Sailor

Looks like any other *seventy-two* inch steel ingot—but is it? Trained down to fighting weight, it is a *twenty* ton sailor aboard an oil tanker . . . a ship's shaft to turn propellers against the heavy seas of the North Atlantic. Its "trainers" . . . experts in forging, heat treating, machining . . . men of long experience in quality control carefully check every step of the way to make sure

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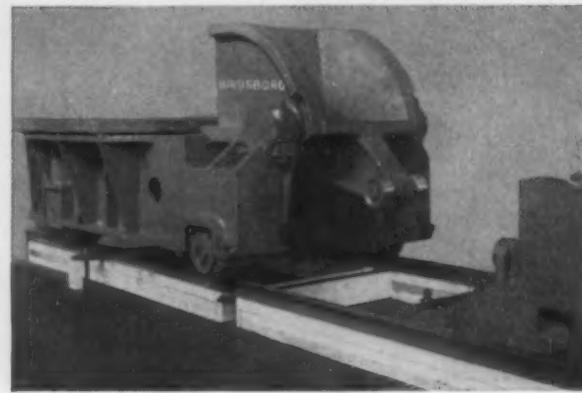
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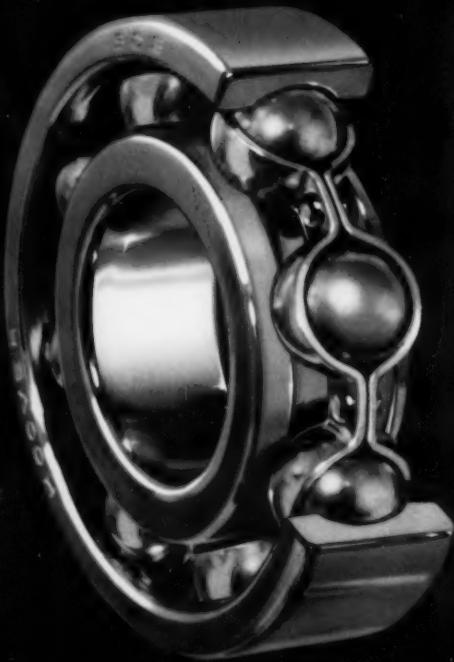
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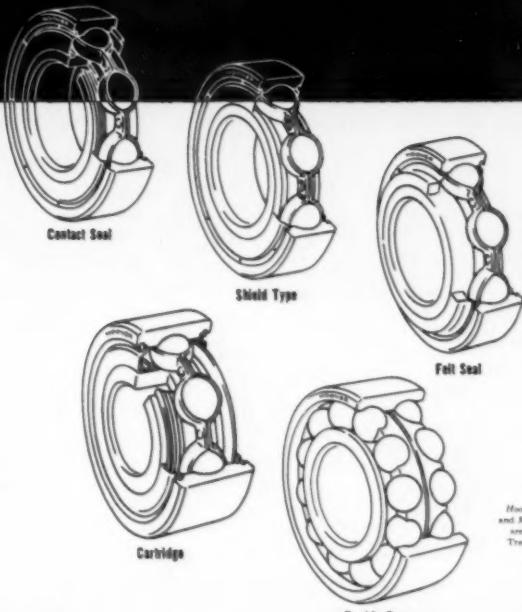


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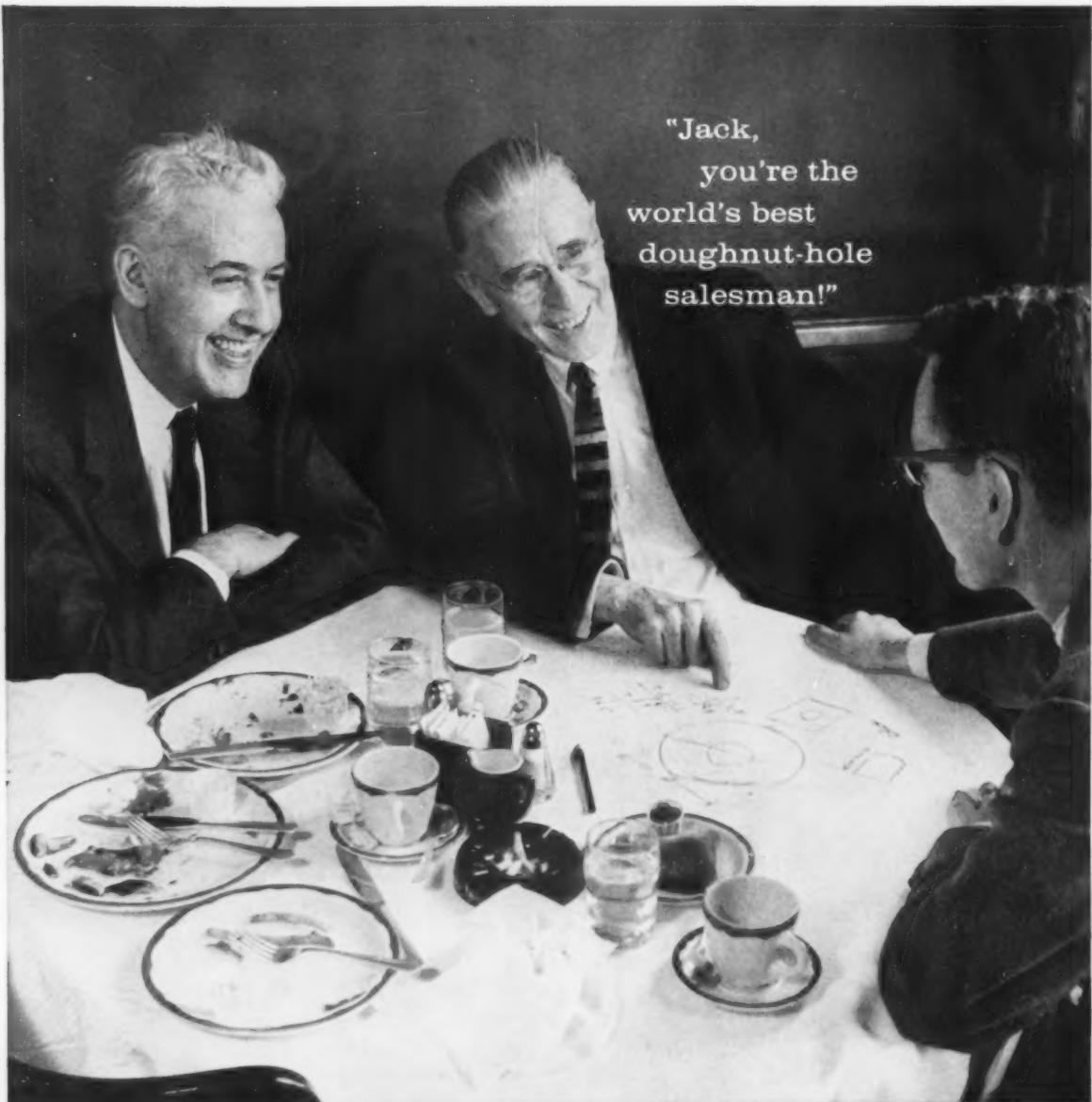
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"Jack,
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salesman!"

Bringing two purchasing agents together over a friendly lunch resulted in an unusual sale.

It all started at the plant of an appliance manufacturer where Jack Hammond, an Inland sales representative, watched as a 12" diameter hole was blanked out of a sheet of steel. Noting carts filled with the punched-out discs, he asked what was done with them. "We sell them for scrap," was the answer.

A few days later, Jack was in the plant of another customer . . . a metal specialty fabricator. Here, he saw a cup being drawn from steel circles . . . and got an idea. After cross-checking specifications, he found

that the scrapped blanks of customer "A" would work perfectly for customer "B."

Getting these customers together at lunch had this happy result: one, now, obtains a much better price for his blanks . . . the other has a steady source of pre-shaped steel circles at a price that reduces his production costs over \$6,000.00 a year.

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Clad Against Corrosion

In clad form, four highly corrosion-resistant alloys are expected to provide low-cost protection where corrosion is a major problem. The cladding process uses heat to bond the layer of costly corrosion-resistant material to the low-cost backing material. It's said to be the first time the process has been applied commercially to these materials.

Remote Action Pump

Liquids, gases or slurries pass through without any contact with pump parts. There's no contamination or cleaning necessary when changing from one fluid to another. How does it work? A series of cam-operated fingers press against flexible tubing in sequence to impart a unidirectional motion of fluid in the tube.

Aging Process at Hand

Already done on an experimental basis, aging of low carbon sheet steel has moved out of the laboratory. Both chemical and mechanical processes are successful. The chemical process is better for deep-drawn parts. The development of non-aging steels is good news for automotive production engineers and other quantity users of sheet stock.

Trade With Reds?

There's a better-than-ever chance the government before long will permit shipment of machinery and other essential products to Communist countries. Such exports have been banned for the past 10 years. What Russia wants most: machine tools, military equipment, plus long lists of metals, minerals, and chemicals.

Elastomer Resists Heat

A new elastomer resists liquids at temperatures over 400°F. It raises the heat barrier for critical parts on aircraft and missiles. The synthetic rubber forms seals, O-rings, fuel cells, hose, caulk, coatings and adhesives. Standard rubber

processing equipment can be used. Commercial plant will go into production early next month. It's expected that commercial applications will soon outstrip military uses.

New Bond for Auto Wheels

A new process bonds aluminum diecast automobile wheels to centrifugally cast gray iron brake drums. The bond is ductile and creates excellent heat flow conditions between drum liners and aluminum wheel. Reported to be a low-cost method, the process takes place in the diecasting machine where the aluminum is injected under pressures of 6000 to 10,000 psi.

Meet Missile Needs

The steel industry is making a concerted effort to meet missile needs for metals. Industry committees are attempting to spell out requirements. Individual mills are comparing notes freely. The biggest producers are getting into the picture, even though current estimates don't indicate tonnage business. One major mill is sending a top metallurgist to the West Coast for a year to gather missile data.

Metalworking Puzzler

While ultrasonic welding is an established technique and its benefits are well known, not much is known about why it works or of its ultimate capabilities. One laboratory is conducting both basic and applied research into the secrets of how ultrasonic energy causes metals to be joined.

Vinyl Coatings Catch On

Look for many new uses for vinyl-coated metals in the next few months. This method of metal coating has caught on fast. Chemical companies have ample capacity for the plastics materials needed. At least four major steel producers are well into the pilot stage. Vinyl material may be had in any color or texture. Bonding is simple and effective.

**FARVAL—Studies in
Centralized Lubrication
No. 218**

Farval lubrication first choice for Hill-Acme Upsetter

BUILDING peak performance into their machines is a point-of-pride with Hill-Acme. That's why you'll find Farval lubrication systems on H-A machines such as this upsetter.

When the going's rugged, with shock, vibration and wear trying to take their toll, Farval continuously guards 59 vital bearings...continuously delivers measured amounts of lubricant at regular intervals.

More and more, machine designers, engineers and production men are turning to Farval for the kind of lubrication that spells uninterrupted, maintenance-free production. Let us tell you more. Write for Bulletin 26-S. The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.



On this 1½-inch Hill-Acme Upsetter, Farval's timing cycle can easily be changed to conform with the service of the machine. Amount of lubricant delivered to each bearing is also adjustable.



How to Make a Success Of Selling Your Company

By W. C. Denison, President, Denison Engineering Div., American Brake Shoe Co., Columbus, O.

There's a lot more to the sale of a business than agreeing on a price.

The owners must safeguard the long-range interests of the employees, the company and their customers, as well as the new management throughout the transaction.

Here are some of the rules one man followed in looking for a logical buyer.

■ A little less than three years ago the American Brake Shoe Co. purchased The Denison Engineering Co. I remained as president and chief executive officer of the new subsidiary and became a member of the American Brake Shoe board of directors, a vice president of Brake Shoe and a member of its Operating Policy Committee.

Since then many people have asked me about the sale of the company I founded 27 years ago to manufacture hydraulic equipment for ceramics and metalworking.

Much has been said about company acquisitions in the past ten years—mostly from the purchaser's point of view. But it takes two parties to sign a contract. And there

DOTTED LINE: Signing the papers that made Denison Engineering Co. a division of American Brake Shoe Co. are, below left to right, former owner W. C. Denison and W. B. Given, Jr., chairman of the board and Kempton Dun, president of the new parent company.





ACTIVE HAND: Keen interest is shown in work of nonprofit Denison Research Foundation founded by Mr. Denison to advance research and development work in hydraulics and electronics.

Combines Sales and Engineering

■ W. C. (Bill) Denison could serve as a model for the typical metal-working company president. His interests run heavily to engineering and sales and everything he does is flavored by these two gospels. One of his basic creeds is that everyone is a salesman.

If he drives a sports car (and he does) it's because he knows what's under the hood, and likes it. His ham radio station in his residence office at Loch Lomond, a Columbus, O. suburb, is one of the most powerful and complete in the State of Ohio.

Keeps Hand In—He founded the Denison Research Foundation to further the advancement of hydraulics and electronics—and more than likely to make sure he would always keep a hand in inventive engineering.

Like many other founders of successful firms, Bill Denison combines his love for engineering with a talent for practical management and an aggressive marketing bent.

During the nineteen twenties he was general manager for the Cook Motor Co., Delaware, O., a manu-

facturer of heavy duty vertical gasoline engines. His interest in hydraulic power led him to found The Denison Engineering Co. in the same city in 1931. He later expanded the company's line of hydraulic equipment to include hydraulic presses, special hydraulic power units, and equipment for industrial, agricultural and aeronautical usage.

Today the Denison Columbus, O., plant employs over 600 persons. The company also operates another plant in Delaware, O.

Looked For Growth—When Mr. Denison sold his company to American Brake Shoe in 1955, he did so for personal reasons and also with a view to furthering the company's future growth.

His management contract called for him to continue as president and chief executive officer of Denison Engineering Division. And, happily enough, with these duties and those of a director, a vice president, and a member of the Operating Policy Committee of American Brake Shoe, he's never worked harder in his life—nor enjoyed life more.

is a lot more to selling a company than agreeing on a price.

What The Seller Wants—Of course, like anyone else, the owners of a company are more than casually interested in what is called security. But if they are also concerned for the future welfare of the employees and the company (and want to remain active in its management), there are certain guideposts to follow in successfully selling the firm.

In sizing up a potential buyer, the first thing to find out is why he'd like to buy you out. Next, what kind of people are they? If the company just wants to acquire a profitable product line, then the chances of attaining the objectives I've outlined are not bright.

On the other hand, if they look on your company as a growing profit center; a source of fresh management talent; and want to capitalize on your experience in marketing, manufacturing, research and development — then you have at least made a start.

But it's still only a start. Good intentions are no guarantee of a mutually successful marriage. You must look at a prospective purchaser's record over a relatively long period of time. This goes for both the buyer and the seller.

What The Seller Gains—Aside from financial gain, there are definite advantages in selling to a large company.

For one thing there is a greater opportunity for growth. With taxes what they are today a company can expand only within certain limits. The capital resources of a larger firm can boost a smaller one past the breakthrough point—and enable it to grow on a larger scale.

The management of the acquired company also gets a chance to work with, and as a part of, a bigger team. This not only broadens their experience but opens up whole new avenues for advancement.

These benefits occur only when the right kind of a deal is made. But there is much that one can do to make sure that by making the sale you are getting what you really

want before the agreement of sale.

If there's one thing a selling company wants from the new parent company management, it is the ability to operate freely and maintain its company identity.

Look For Growth—It can get it if the company is sold to the right people in the right way—on the basis of its product record, team record and growth record.

Another thing a prospective seller should look for in a prospective purchaser is a young management team, responsive to growth and with the ability to make changes when necessary. There's no sense hitching your wagon to a horse that isn't going anywhere.

Getting tangled up with a runaway horse doesn't make much sense either, so be sure that your prospective buyer also has a high degree of progressive conservatism in his fiscal and operating policies. Look carefully at their board of directors!

Finally, it is most important that the buying company have a long record of dividend payments. If it has been able to manage its own affairs profitably over the years, then the chances are good that it

can do even better with your company in the picture.

The Human Side—So far I've dealt mostly with the purely business relationships between the buyer and the seller. But there are very formidable human problems to be considered also. More often than not they are the main cause of a breakdown in negotiations.

If there is one bit of advice I'd like to offer those thinking of selling their company, it is to take your time. I don't believe in short engagements—particularly when business marriages have less than a fifty-fifty chance of succeeding.

Before we accepted American Brake Shoe's offer we had been approached by six other large companies over a period of four years, each one resulting in an offer to purchase. And the negotiations with our present owners extended over eighteen months. You need this much time, not only to get to know each other before the sale, but also to carry you through the early stages of the acquisition.

Get Other Opinions—Another important point is never keep your plans entirely to yourself. Use your own management group as a sound-

ing board. Their reaction to an interested buyer can be of invaluable assistance in getting a well-rounded view of the other company's ability and integrity. This will also give you an opportunity to appraise the feelings of your top executives regarding a prospective purchaser, and how they would fit into the new picture—which is most important. Also, it goes without saying that you should confer with the best tax man and attorney you can find.

Above all, don't fail to get your wife's opinion. She probably knows your real desires better than you do and is as much concerned as you are. She will be more alert to the possible social changes in your life.

Again, on the more personal side, you must consider how selling your company will affect you psychologically. Make sure that you are getting what you really want. You might like to keep your hand in the business or leave it entirely. Either way, don't delay this decision.

Rough Spots—There are bound to be a few rough spots during the early stages of any company merger.

But these things can be solved if the agreement of sale was consummated in a spirit of mutual trust.



FILL IN: Top management group should serve as sounding board in reaching decisions affecting the sale

of a company. Their combined reactions will give well-rounded view of prospective buyer.

Warehouses Expand Net Pricing

System May Be Applied to All Products and Sizes

New system being tried out in Portland lists total price for all items in stock.

Customers appear to like the idea, but it has its drawbacks as well.—By K. W. Bennett.

■ Warehouse customers and steel warehousemen are keeping a close eye on the new "net pricing" system for steel products now in operation in Portland, Ore.

There is only a ripple of interest at the moment. But it may grow. The Portland system of net pricing is a test-tube version of a new approach to steel service center pricing that could interest the industry and its half-million customers.

How It Works—Under the Portland net pricing system, total price for any single grade, size and quan-

tit y of steel is listed. A customer need not estimate from a base price. He can either find it himself in his own price book; or he can get it from the warehouseman in a matter of a few seconds.

Net pricing isn't new, but it's growing. Central Steel & Wire, and Joseph T. Ryerson & Son already use such systems. Customers appear to like it. It's speedy, cuts both customer and warehousemen's time in figuring total cost.

Item by Item—The Portland system is slightly different. Each grade, size, and quantity of steel has its own net price. But the net price is not based on mill cost plus overall warehouse handling and storage cost.

Instead, handling and carrying costs are figured for each item. A product with six times per year

turnover can be priced more competitively than an item with two or three times annual turnover.

Used on Bar—In at least six cities, a similar pricing arrangement has been worked out for cold-finished bar. The Portland announcement is the first covering flat-rolled and bar stock in both hot and cold-rolled grades.

Will it spread? It has in cold-finished bar. Adding to the possibilities, several warehouses are already publishing net prices, or are studying the idea.

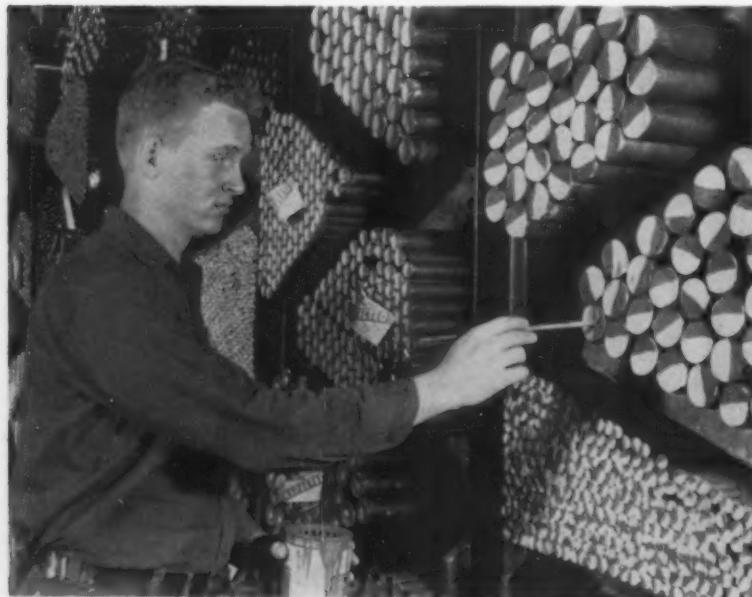
They know consumers, when exposed to net pricing, are enthusiastic. To price grades and sizes on their rate of turnover is only one step further. Warehousemen have already begun to figure inventory costs by individual items and sizes. This same data can be applied to the new pricing system.

What are the drawbacks? Net pricing of any kind requires a price book listing every grade and every size of angle, bar or sheet for each of those items.

Paperwork and Printing—One warehouse, for example, lists 168 prices for its merchant quality hot-rolled 1020 bar. That's an expensive printing bill, even for a large warehouse. A general price change means all of these prices must be republished. Often warehouse inventory is so extensive that automatic calculators must be used to do the arithmetic.

As one veteran pointed out: "Why all this fuss about printing? We're selling steel service, not pricing systems!"

But cost-by-item pricing could be the third in a group of important pricing changes by warehouses in recent months.



TOTAL PRICE: Net pricing enables warehouses to be more competitive where it counts, in products with fastest turnover. It takes in a key factor in the steel service center—the cost of carrying steel inventories. Portland, Ore., is test center. Joseph T. Ryerson photo.

First—Announcement that cold-finished bar orders could be combined for a quantity discount. This has always been true of hot-rolled bars. It's now believed this will spread to other cold-rolled grades.

Second—Growing use of net pricing. This means less time lost on arithmetic for warehousemen, particularly on small orders; and easier price estimating by the steel buyer.

Third—A new pricing system that recognizes warehouse costs for each item sold, and allows warehousemen to price most competitively in the grades in which he does the most business.

The Portland system takes into direct account the thing that makes the steel service center of particular value to steel buyers—the cost of carrying inventory.

Institute to Translate Russian Documents

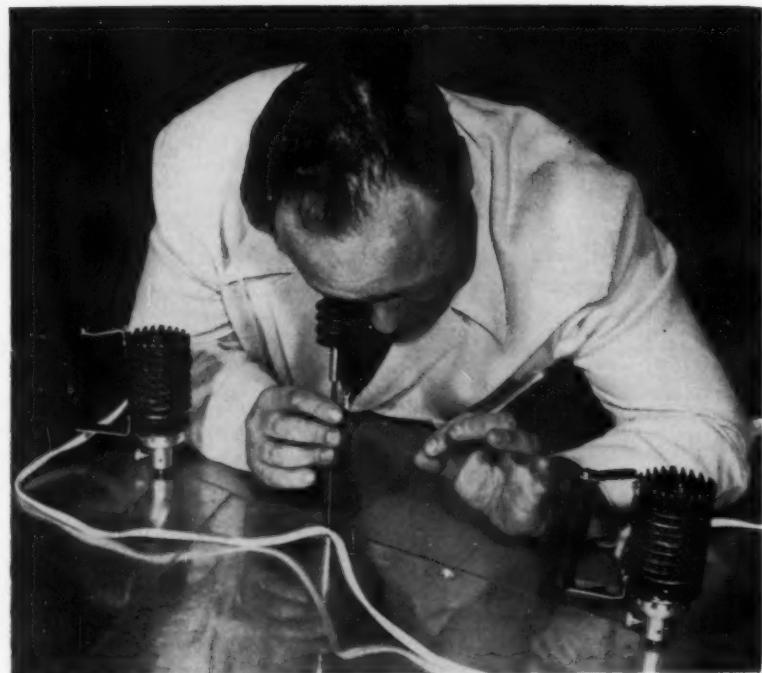
Several American industrial laboratories spent five years and at least \$200,000 on studies of the design of electrical circuits. Then, reports Allan T. Waterman, director, National Science Foundation, they discovered the work had already been done. It was described in a Russian journal published before the American project had begun.

To prevent this from happening again, and to make better use of extensive Russian research, the Pergamon Institute was formed.

United Nation Members—It is a non-profit organization to translate major Russian scientific papers into English. Copies will be available to doctors, scientists, and engineers from United Nations countries.

A secondary goal will be to encourage the teaching of Russian in American institutions. Right now, says the group, only 2 pct of our working scientists can read Russian.

The Pergamon Institute is located at 122 E. 55th St., New York 22, N. Y.



SLENDER AS A STRAW: After B-58 bomber flight, Convair engineers remove a few bolts from wing, lower in lights and viewer, and take a look inside. Same method can be used to take interior photographs, spray with die to check size of cracks, and drill to minimize their growth.

Medical Scope Spies On Wing Interior

■ A technique borrowed from medicine helps Convair Div. of General Dynamics Corp. check the inside of a sealed wing on the world's first supersonic bomber, the B-58 Hustler.

The inspection method was born when Frank W. Davis, chief engineer at Convair's Fort Worth plant, recalled how doctors use a gastro-scope and bronchoscope to view a patient's interior.

The idea was sound, but finding the right type of viewer was difficult. A search of local clinics and laboratories didn't turn up a suitable one. So V. D. Palmer, of Convair's wing design group, began writing letters to medical instrument manufacturers.

Lens View Magnified—However, most medical scopes proved too short, failed to provide enough light for the tomb-like interior of the wing, or were too large in diameter. Finally, experimental model borescopes were received from two firms, American Cystoscope Makers, New York, and Plummer and Kershaw, Philadelphia.

They contain an internal lens system. The eyepiece provides a greatly magnified view of objects seen through a tiny objective lens on the other end. The lens is so small it can be covered by the lead in a blunt-pointed pencil.

The light problem was solved by "piping in" the reflected light from an outside 50-watt bulb.

Stainless Gears for Aircraft Era

Mills Struggle With Technical Roadblocks

Aircraft and missile potential for stainless grows with rising flight speeds.

But limitations of rolling mills create problems for designers and builders—By T. M. Rohan.

■ Stainless steel producers and airplane and missile designers are feeling their way into a new era.

The steel men are working feverishly to gage the scope of Sputnik-age aircraft and missiles

markets and get ready for a possible rush.

The aircraft and missiles designers welcome stainless steel as one of their best hatchets through the so-called heat barrier. But aircraft quality standards are a far cry from conventional commercial standards, and this is one of the big stumbling blocks.

What is Needed — One of the biggest needs is for stainless steel

sheet to protection-wrap the next series of Air Force planes from the elevated temperatures encountered beyond speeds of Mach 3 (2100 mph at sea level). Not one rolling mill in America today can produce stainless sheet wide enough and flat enough to meet AF requirements. This problem may only be licked with another large metal-forming program similar to the Heavy Press Program — but this time for a new series of rolling mills.

Airplane builders would like stainless sheets and plate 150 in. wide. Standard width now used is 48 in., necessitating welding at some precious weight sacrifice. And designers are talking of 1 pct flatness. Some 100 in. wide Sendzimir-type mills which could do it are in the design stage and 120 in. wide mills are in the talking stage.

A Big Market — Even with the current lull, stainless tonnage shipped to aircraft and missile makers this year could hit an all time high of 56,000 tons. This would be a good recovery after 1957's estimated shipments of about 48,000 tons due to aircraft cutbacks. Best year on record is 1956 at about 55,000 tons.

The steelmakers' dilemma is two-fold: (1) predict the volume and determine whether it can justify expansion, and (2) determine whether aircraft quality requirements can be met with present rolling mills, redesigned and rebuilt, or whether new mills will be needed.

The Potential — "We are looking for about a \$200 million annual market in the 1960-65 era," says Ray Sloan, Armeo Steel development engineering manager. "While tonnage may be in the order of

Aircraft Industry Takes More Stainless

Stainless steel consumed by aircraft industry.



IRON AGE estimates based on industry sources.

75,000, much closer property specifications, and closer size tolerances in light gauge material will boost the dollar volume."

Allegheny Ludlum feels annual tonnage could climb to 75,000 per year after 1959.

Belt Grinder Approach — Another strong contender is wide abrasive belt grinders. One Hill-Acme model installed at Bell Aircraft Co. will take sheets to 48 in. wide and 12 ft long. In experimental use on stainless it has ground it to plus/minus 0.001 in. and will handle aluminum, titanium, alloy, and other materials. Another being installed at Mallory Sharon Metals Corp. will take sheets to 48 in. by 120 in. It will grind titanium sheet to 0.012 in. thick with plus/minus 0.002 in. tolerance and eventually 0.001 in. Other machines have been installed with tables up to 84 in. wide and 40 ft long. And Hill-Acme also has a proposal out for one 120 in. wide by 40 ft long.

Cost of the grinding machines would also be substantially less than Sendzimir-type mills. One 84 in. by 40 ft abrasive belt grinder costs about \$250,000 to install compared to almost \$2 million for a 48 in. Sendzimir today. Abrasive costs however are a significant factor. On grinding hot rolled carbon sheet, for example, cost of the abrasive belts in one year of high production grinding about equals the cost of the machines.

Technical Breakthrough — Another already established breakthrough is the precipitation hardening grades of stainless. These are shipped from the mill in a "soft" condition for easier forming. After this they are solution-treated, then deep-frozen and then low-temperature aged. These grades will stand the 850°F heat and stresses of Mach 4 flight.

Better Than Expected — "At present it is difficult to pinpoint all the potential supersonic aircraft and missile applications, but the tonnage already exceeds our earlier expectations," says William B.



HUSTLER: Technicians work on stainless steel honeycomb wingflaps of Convair's B-58 Hustler supersonic bomber. Use of stainless here is typical of its growing use in aircraft to meet supersonic requirements.

Pierce, vice president in charge of sales. "New alloys such as AM-350 are achieving wider use and several other special alloys are under intensive development."

"Certainly if all the projects materialize for which stainless is being considered, tonnage for aircraft and missiles in the 1959-61 era could hit 75,000 per year."

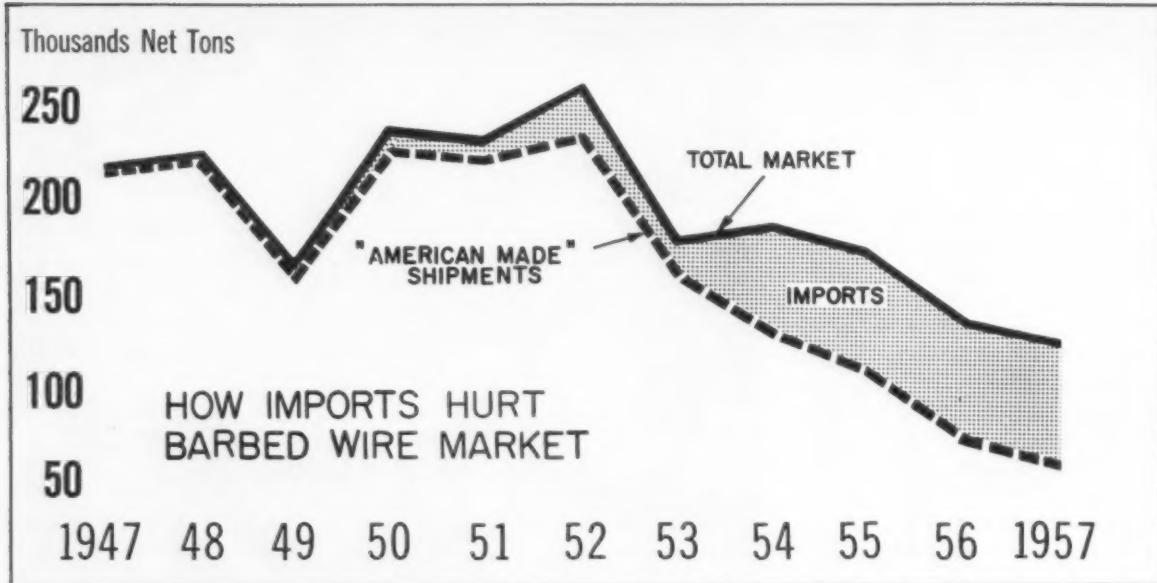
Second to Automotive — The aircraft industry has been Allegheny Ludlum's second largest market for stainless and high temperature materials for several years. It accounted for over 10 pct of company sales last year. The automotive industry remains the top single consumer of stainless steel.

Authoritative estimates of present consumption of nickel bearing stainless for all military aircraft is put at up to 40,000 tons per year. It includes airframes, engines, and missiles but not accessories like landing gears and hardware. These take an extra 25 pct, bringing consumption to about 50,000 tons per

year. Air Force use of nickel bearing stainless for airframes only is now about 5300 tons per year.

Designers Want Stainless — Yield factors for stainless vary on different planes. As a rule of thumb, about 4 lb of metal are required at present to produce 1 lb of finished airframe and engine. For a new chemically fueled bomber, out of 234,000 lb of raw stainless and titanium, 71,000 lb end up in the finished airframe.

Despite fabrication difficulties, the properties of stainless are so attractive to aircraft and missiles designers that they are overlooking nothing in their drive to use more of it. In the B-58, for example, about 1000 sq ft of skin per ship is tricky honeycomb construction. In this, thin foil must be rolled and brazed giving it both the structural strength and high temperature resistance. Costs are high and fabrication tricky but the 1350 mph B-58 was designed expressly to use stainless.



Grim Forecast on Steel Imports

■ Some grim predictions about the rising tide of steel imports are made by Robert S. Lynch, board chairman of Atlantic Steel Co.

Testifying before the House Ways and Means Committee last week, he maintained that "unless this trend of imports is sharply turned by Congress, it's only a matter of time before every American producer, regardless of where located, will suffer."

Widening Sting — Tracing the widening geographic range of imports, Mr. Lynch added: "From the south Atlantic ports, foreign steel has spread until it is now a serious and growing problem in the areas served by the Gulf ports, the north Atlantic ports and those up the Mississippi."

"Also, imports of steel are up 88 pct in four years on the West Coast. The problem will soon be nationwide, particularly when the St. Lawrence Seaway is open. Then Pittsburgh, Cleveland, Chicago, Detroit and other industrial centers

affected by the Seaway will feel what others of us feel now."

While noting that the imports were greatest in farm fencing, barbed wire, nails, and reinforcing bars, the steel spokesman pointed out that foreign shipments of large steel products—shapes, plates and pipe—were increasing. "By underpricing," he warned, "the importers will take those markets, too."

Tailor-Made Products — Foreign producers plan their export programs carefully, Mr. Lynch said. "Many imported items do not come by chance . . . they have been designed and manufactured solely in order to enter and take our markets. For example, barbed wire is an item rarely used outside the United States—but foreign producers have recently begun to make it and send it here in growing quantities, so that about two-thirds of the American barbed wire market is already in their hands."

Our encouragement to foreign industry since World War II, Mr.

Lynch maintains, has led to an unbelievable situation. "It is as though we were holding a gun at our own head with one hand and digging our grave with the other."

What imports can do to a domestic producer was pointed out by Mr. Lynch in discussing his own company, Atlantic Steel. After spending \$15 million for post-war expansion the firm found itself being closed out of regional markets even though its prices fully meet those of American competitors.

"In 1957," said Mr. Lynch, "our sales of fence were 72 pct below those of 1953 . . . nails had dropped 30 pct . . . barbed wire was down 84 pct . . . and reinforcing bars were 40 pct lower."

"However, during this period imports of these items into our area rose as fast as the speed of our losses. In 1957 imports of foreign fence were 966 pct higher than in '53 . . . imported nails rose by 340 pct . . . barbed wire imports were up 412 pct, and reinforcing bars were 153 pct greater."

Plastic-coated Pipe Branches Out

New Applications Expand Market Potential

Oil and chemical industries put plastic-steel combinations to work.

They meet the test of highly-corrosive industrial conditions.

—By G. J. McManus.

■ One of industry's busiest underground movements broke loose on several fronts recently with announcements of new steel and plastic combinations.

Jones & Laughlin Steel Corp. came out with a plastic lined pipe for oil field and chemical uses. Swepco Tube Corp. said it was bringing out a similar product. National Electric Products Corp. introduced a plastic coated electric conduit.

Still under wraps are U. S. Steel's development of plastic coated sheet; Battelle Memorial Institute's project for plastic coating of common pipe; a West Coast test of plastic lined irrigation pipe.

Anti-Rust Goal—Most of these and other efforts aim at finding an answer to corrosion. Rust has been one of the big sore spots in steel's defensive action against aluminum and copper. An alliance with plastic has long seemed the natural answer. Steel provides the strength; plastic offers protection.

The problem has been to find a low cost sandwich of the two materials. National Electric Products feels it has the answer for its field.

Vinyl Coating—"We've got a hot potato," says an official of the company, which is selling a vinyl coated conduit for the same price as conventional galvanized conduit.

He says accelerated corrosion tests show the plastic coated tubing outlasting galvanized by a wide margin. In a 7½ pct solution of sulphuric acid, the new conduit is re-

ported lasting 72 hours against 6 hours for conventional types.

Interest Grows—Significance of these figures lies in the spread of severe corrosion conditions, says National Electric. It figures 60 pct of the conduit installed during 1956 and 1957 went into areas of low-to-medium corrosive intensity.

Forty per cent of the total went to areas of medium-to-high corrosive intensity. The severe corrosion group is growing, says National Electric, with practically all industrial applications offering tough conditions.

Other Reports—This appraisal ties in to some extent with Jones & Laughlin's experience with its PVC pipe in oil field application. With the new plastic jacketing permitting pressures of 1000 psi or more and a slight boost in the 130°F temperature ceiling, J&L felt PVC would get good response from oil field people. It has.

J&L has been pleasantly sur-

prised by interest shown by the chemical industry.

Swepco reports its jacketed pipe is going over well in both the chemical and pharmaceutical industries.

Room for Research—In standard pipe applications, high costs bar the use of plastic coatings. A technical breakthrough will be needed to put plastic over the top in this area. One pipe man feels the day of commercial marketing is not far off.

Battelle Institute, in a project sponsored by the American Iron & Steel Institute, has come up with some good looking epoxy phenolic plastics.

They have shown up well in performance tests. The difficulty now seems to be in finding a low-cost method of application. As it stands, the steel surface requires fairly extensive preparation before plastic can be applied.

One thing is sure. Demand for new coated pipe is increasing. The outlook could broaden considerably.

What Steel Is Doing With Plastics

	Steel	Plastic	Plastic application	Status
Jones & Laughlin	Electricweld pipe	Polyvinyl chloride	Inside liner	Commercial
National Supply Co.	Oil country seamless	Epoxy phenolic	Sprayed interior coating	Commercial
National Tube Div., U. S. S.		Polyvinyl chloride	Plain plastic pipe	Commercial
Republic Steel	Linepipe	Polyethylene	Extruded outside liner	Commercial
Swepco Tube Corp.	Electricweld	Polyvinyl chloride	Inside liner	Commercial
Thomas Strip Div., Pittsburgh Steel	Strip	Preformed sheet	Bonded surface	Commercial
U. S. Steel Corp.	Sheet	Vinyl	Dipped coating	Development

Don't Spend Your Tax Cut Yet

A Lot Can Happen Before Cuts Are Adopted

Sentiment is strong and talk loud about tax cuts as an anti-recession measure.

But not all agree on the type of cut and a business upsurge could call the whole thing off.

—By N. R. Regeimbal.

■ Fate of mushrooming plans for a big Federal tax cut will rest on how business, employment, and consumer spending behave over the next 45 days.

In the meantime, the word is this. Don't spend any tax cut money yet.

Both parties are busily talking, drafting, and introducing tax cut programs for use if needed. And

they already appear to be headed in the same general direction: A big cut of \$6 or \$7 billion, going mostly to individuals in the lower income group, but including reductions for corporations, small business, and some excise tax cuts.

Talk Is Cheap—But don't be led down the garden path by all the shouting and screaming now. Current tax cut talk is in the same league with political campaign promises.

The Democrats found the current business recession a ready-made issue to lay on the GOP doorstep. Their tax cut talk originally was simply a part of that issue.

Recent Republican tax cut statements from the President on down

represent a change of direction forced by political pressure—they have to get on the record now.

When carefully analyzed, however, the White House hasn't changed much from its original position that a tax cut "may be necessary" if the economy, with the help of other actions such as increased public works spending, fails to turn up by spring.

Factors Against—Three factors still mitigate against a tax cut. First, while it might restore consumer confidence for a little while, it wouldn't put more than \$1 to \$3 a week in most family paychecks. Second, the loss of revenue would hurt the current military missile and conventional arms buildup. And third, it would be inflationary.

The President's economic experts still expect that the business slump will have hit bottom by early April or even late March. They expect spring weather and the normal seasonal rise in jobs to reduce unemployment—which rose to a sixteen-year high of 5.2 million in mid-February. The usual spring upsurge in consumer buying of both hard goods, such as new cars, and of soft goods, especially clothing, should help restore industrial activity and confidence, they believe.

Likely Choices—As of now, here are the front runners in the tax cut derby: A cut in personal income taxes by cutting the tax on the first \$1,000 of annual income in half, to 20 pct, or by raising the personal deduction by \$100 per person; a reduction of a few percentage points in the 52 pct corporation tax rate; repeal or reduction of the 10 pct manufacturers' excise tax on automobiles and the 3 pct tax on freight transportation.

The Last Word on Expense Accounts

A Reprieve—Most expense accounters got a reprieve from the latest Internal Revenue Service regulation. It relieves employees who account for their expenses to their employers from the obligation of reporting their expense accounts on Line 6-A of their tax returns.

The regulation modifies the previous rule that provided all employees must itemize expense account money on their income tax returns.

Once Is Enough—But the employee who does not account to his company still must report the total expenses, including travel, transportation, entertainment, etc., incurred by the employee but which are charged to the employer.

The regulation is designed to minimize abuse of expense accounts

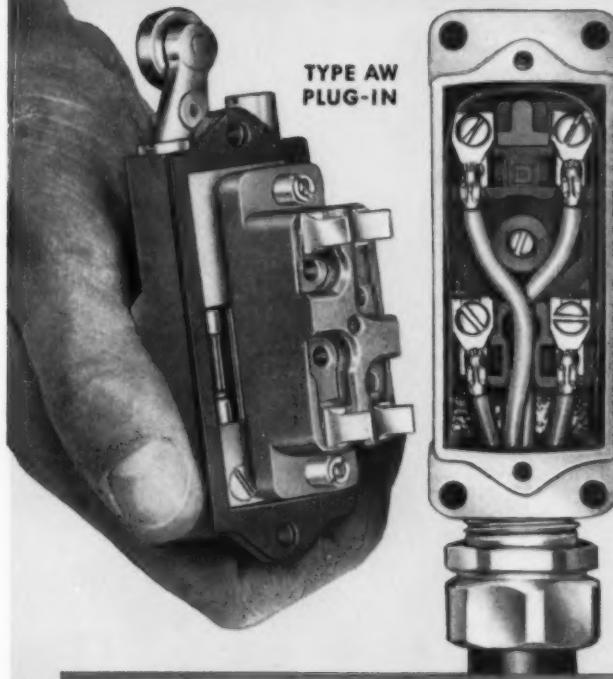
in such a way that they result in tax-free income. The theory now is modified that one accounting is enough.

It further saves the individual and the company the hardship of detailed record keeping of relatively minor expense accounts.

Still a Check—He still must state on his return that business expense funds received did not exceed the ordinary and necessary business expenses paid by the employee, or if they did, that the excess is included as income.

While relieving the average man who occasionally or even regularly uses an expense account, it still provides the means of checking up on many of those suspected of using expense accounts as an income tax dodge.

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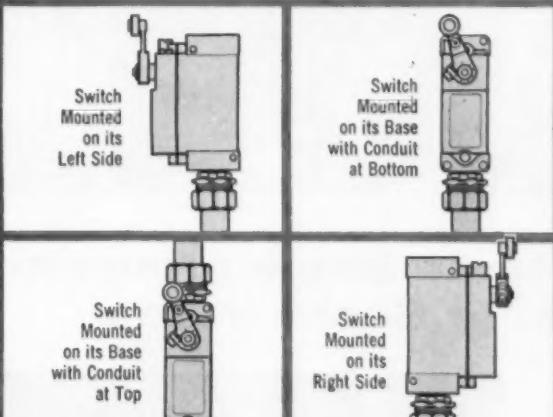
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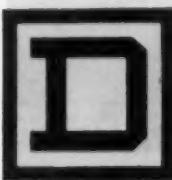
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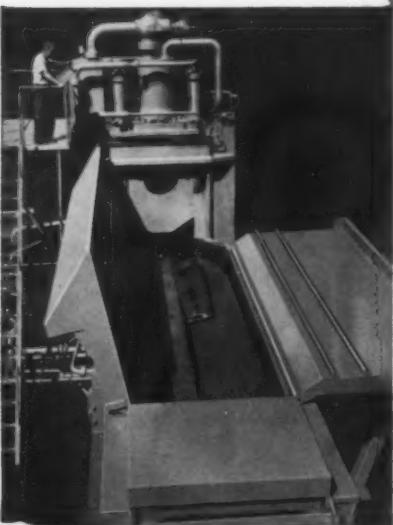
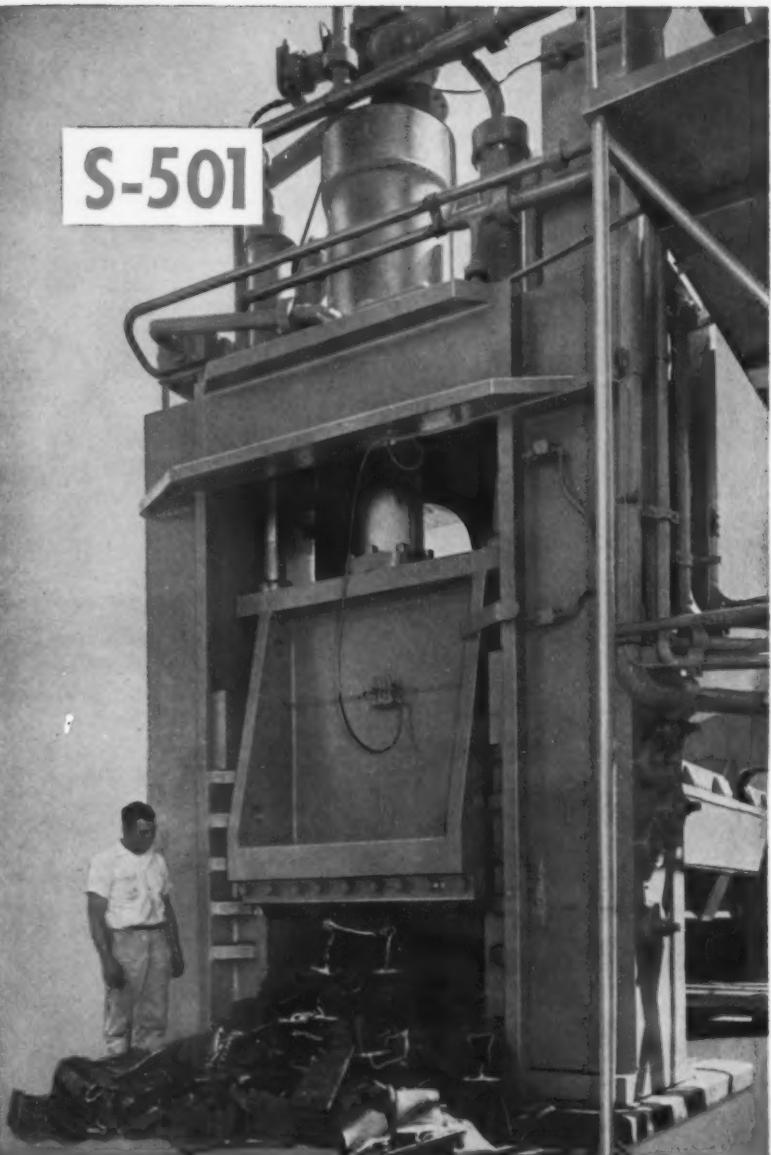


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► *Talk with a Man from Harris*

Educator Tells Top Foundry Needs

Top needs of the foundry industry today are research and merchandising. And the research man would probably do better with no foundry background at all.

This is what Dean C. J. Freund, University of Detroit engineering college told the Foundry Educational Foundation in Cleveland. Also, foundry research should concentrate mostly on metallurgy and ceramics. Beyond this it should go on into heat transfer, fluid physics, elasticity, and plasticity of materials, heat, thermodynamics and solid state physics.

Grant—At the meeting Wheelabrator Co. of Mishawaka, Ind. announced it was giving FEF a \$100,000 grant to promote graduate study.

Many men who could carry on research for the foundry industry are going into government jobs, electrical equipment, communications, aircraft, oil, chemical and missile industries, said Dean Freund. The foundry industry ought to be able to capture a few as they get out of university graduate schools.

Harder Selling—On merchandising, foundries "ought to retire the sales fellow who pays routine visits to purchasing agents offices," said the U. D. educator. Also, they shouldn't let the customer write all the specifications.

The foundry industry's highly technical future was also reiterated at a banquet meeting by Dr. Clyde E. Williams, former president and director of Battelle Memorial Institute, now head of his own consulting firm in Columbus, O.

New Technology—"Foundries will be called upon more and more to handle exotic metals, to melt and cast in vacuum or inert atmospheres and to produce products to exacting standards of precision," he said. "Here again the greatest overall benefits to your business volume will be the indirect sales in conventional lines that this new technology will generate."

Bottle With a Powerful Kick



PURE FUEL: Workers at Titanium Fabricators, Inc., rinse a bottle which will control the flow of propellant into combustion chambers of the Atlas ICBM. It is a light aluminum-vanadium-titanium alloy.

New GE Foundry

General Electric will spend \$3.7 million to put a large, steel casting foundry in its iron foundry building at the Schenectady, N. Y. plant.

Capacity for making larger iron castings will stay where it is, while smaller work will be transferred to other departments.

The new installation will permit GE's Foundry Dept. to produce steel castings weighing as much as 85,000 lb. Currently the limit is 35,000 lb.

An electric arc furnace will have a melting capacity of 200,000 lb of steel or high grade iron.

Zirconium Tubing

Commonwealth Edison Co., Chicago, has placed the largest order ever for zirconium tubing, for use in its Nuclear Power station.

Mallory - Sharon Metals Corp., and Bridgeport Brass Co. will supply almost 44 miles of reactor grade zirconium, 9/16-in. diam, 1/32-in. wall thickness.

It will be fabricated by Atomic Power Equipment Dept., General Electric Co., San Jose, Calif.

February Steel Output

Output of ingots and steel for casting totaled 5,788,000 tons in February.

This is off noticeably from the 6,753,902 tons made in the longer, previous month, and the 9,987,206 tons produced in February 1957.

The American Iron and Steel Institute report also said steelmaking capacity was utilized at an average of 53.6 pct of capacity.

The AISI index of steelmaking for February 1958 was 90.1, compared with 94.9 during January.

BRIDGEPORT BRASS COPPER ALLOY BULLETIN



Reporting New Developments in Copper-Brass Alloys and Metalworking Methods

by M. A. BUELL
Chief Staff Metallurgist



Practical Annealing Hints When Fabricating Copper and Brass Parts

In fabricating brass and copper parts, proper annealing practice can often mean the difference between profit and loss and acceptable and defective products.

There are, of course, a number of rules to follow, but the two most important are (1) to use the correct temperature and (2) to maintain uniform temperature.

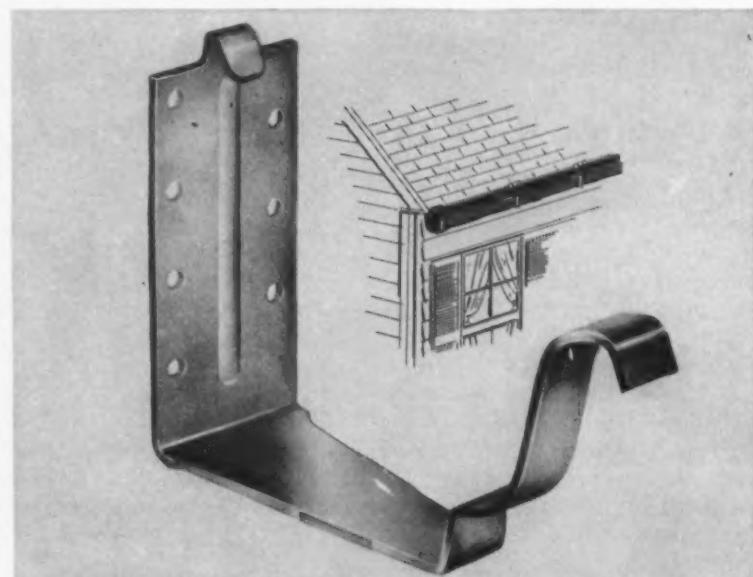
In determining the correct temperature, many variables come into play—weight and distribution of load, size and shape of the article and/or sequence of anneals, type and condition of the furnace, the alloy used, the amount of previous cold working, and the severity of the operations to follow. Generally speaking, experimentation with sample lots is advisable in determining the correct temperature and length of anneal.

For best results, annealing should be done at the lowest possible temperatures. Excessive temperatures produce extra-large grain sizes and "orange peel" effect after subsequent cold-drawing operations, and are also liable to aggravate surface oxidation. The net result is an increase in finishing problems and cost. It should always be remembered that work can be returned to the furnace for further annealing without harm, but damage caused by too high a temperature can never be corrected.

Work should always be thoroughly cleaned before being placed in the furnace. Failure to do this may lead to stains and scale which tend to load the tools and scratch the work and dies. After annealing, pickling with dilute sulphuric acid is essential.

Your Bridgeport Salesman, backed by Bridgeport's Technical Service, can help you. If you have any annealing problems don't hesitate to call him for advice.

How to Hang Low Production Costs and High Quality on the Right Alloy



Hanger for copper gutters is made of silicon bronze for lower production costs, high strength and corrosion resistance.

Use of the right copper base alloy can often result in substantial savings in material costs without any sacrifice in quality or performance. An example is in the new "K" type box gutter hanger manufactured by Berger Bros. Co., Philadelphia, Pa.

Production Requirements

In addition to a high degree of corrosion resistance, this hanger had to have sufficient "springiness" and strength to support heavy snow loads on the gutter. As a result, specifications called for a metal which would withstand a 40-lb. pull test without deformation. Still another requirement was that the metal had to be sufficiently workable to be stamped and formed at high speed.

Choosing the Right Alloy

Originally, Berger Bros. considered using a phosphor bronze for the job, a material which would have been satisfactory. But, on examining all requirements, Bridgeport was able to suggest a way to save costs by recommending

Duronze 632, a less expensive silicon bronze strip. Silicon bronze is as strong and as tough as mild steel yet has superior corrosion resistance.

To meet Berger's rigid production and performance standards, Bridgeport supplies the Duronze strip with a maximum B75 Rockwell hardness. This is achieved by a controlled last rolling and annealing prior to shipment. To date, the Bridgeport silicon bronze has performed with flying colors in all respects.

Teamwork that Saves Costs

This is one example of how Bridgeport's close customer service works for you to insure top product quality and performance at most economical cost. Our aim is to match the metal exactly to your job. It's Bridgeport's wide range of alloys and experienced technical service that makes this a benefit of real value to you. To put this service to work for you, call your nearest Bridgeport Sales Office.



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O. D. Rice

Why 'Honest Engineering' Pays

Knowledge of a customer's operations can be much more than a sales asset.

It can help an engineer do a thorough job of designing and checking new equipment.

Booms and busts may come and go, but to survive in the steel mill equipment business "honest engineering" is the best long range policy says O. D. Rice, vice president and general manager of Rust Furnace Co., Pittsburgh.

By "honest" he means engineering that is based on a practical knowledge of rolling mill operations; where the designer stays close to new installations until all the kinks are straightened out.

A Furnace Pioneer—In the start-up of one bar mill furnace he engineered, O. D. (for Orville David) spent 36 hours straight with the equipment until he was satisfied everything was in top working condition. Such conscientious service builds longlasting business relationships.

And while honest engineering is the best policy, explains Mr. Rice, it must be backed up by "pioneer engineering." A company must have the willingness to apply new ideas rather than fall back on conventional designs.

Proving a Point — Mr. Rice's neck has been extended in a number of pioneering jobs. In one instance, he proved that a stress-relieving furnace needed in building Hoover Dam could operate at 3000 ft above sea level.

While he now emphasizes the need for pioneering, Mr. Rice himself got early recognition by refining the design of the old regenerative



O. D. RICE: There's no substitute for practical knowledge.

type soaking pit. The design he perfected in the early 1930's was equipped with automatic reversal and automatic control of temperature, combustion, and draft. It's still popular throughout the steel industry.

Background — O. D. Rice was born on a farm in West Mansfield, O. in 1897. As a boy, he served a newspaper route. One of the customers who got the specialized Rice service was Warren G. Harding.

O. D. went on to study mechanical engineering at the University of Cincinnati. After wartime service in the Army engineers, he returned to school and got his degree in 1924.

Some Firsts — Then he joined Chapman-Stein Furnace Co. where he perfected the French design of the Stein recuperative one-way fired soaking pit. This equipment is also very much in use today.

In 1927, he helped found Rust Furnace Co. Some of his pioneering ventures include:

The first triple-fired continuous furnace for reheating blooms, built in 1928.

The first double-fired reheating furnace, built in 1929.

The first stress relieving furnace employing indirect fired reversing-circulating design, built in 1933 for use at Hoover Dam.

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Let's examine this "Full Line" product list of cold rolled strip steel. At J&L it includes all carbon grades, coated and uncoated, alloy, stainless and tempered spring steel. It offers all thicknesses from .001" or less to .156" or more, in widths from $\frac{1}{4}$ " to 24"—and tolerances for gauge and width closer than standard when required. There are "Full Line" advantages, too, in a range of controlled tempers and structures possible only with the variety of annealing,

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How Much Will Tax Cut Help?

Many businessmen quietly wonder if tax cuts will get to the root of the business problem.

They will provide added spending power, but offer little aid to the ailing durable goods industries.

■ The business world stands in a position many a company has found itself in: It's in good financial condition, but its markets are dwindling.

For a time, at least, the normal growth factors are in suspension. Markets that were expected to expand have not done so. The recent boom did not do what every businessman had every right to expect it would—create a lasting and expanding market for consumer durable goods.

With Reservations—That is why many businessmen are not accepting wholeheartedly all the anti-recession measures that are being talked about in Congress. They are going through the motions, that's true, but with reservations.

They wonder how a slight tax cut now, even with stepped up government spending and a new public works program, will do what three years of unprecedented and record breaking prosperity failed to do.

Second Guessing—The current situation, with every politician on both sides of the aisle now clamoring for a tax cut of some type, makes a good case for those who asked for a tax cut back in mid-boom.

At that time, with revenues at an all time high, a tax cut could have been managed with very little financial hardship to the country.

Apparently the boom, despite its magnitude, did not generate enough real gain in purchasing power. Second guessing, a tax cut then might have helped considerably.

Buying Power Lagged—For most of the boom, real purchasing power did gain. But long before it was over, rising prices were wiping out wage gains. For a substantial period of peak business activity,

real purchasing power sagged below comparable periods of the previous year.

Now, benefits of a tax cut in halting a recession are not 100 per cent sure. A tax cut will ease hardship and stimulate buying of necessities, which is desirable of course. But it is not likely to get to the root of the case, developing the durable goods markets.

Orders, Sales Still Decline

Where It Hurts—One of the most serious factors in the present situation is the continuing decline in new orders. Latest figures extend only through January, but few businesses could report any reversal of the downturn.

New orders in January for all manufacturing are down \$900 million from December and off a full \$4.7 billion from January a year ago. The rate of decline in January is in line with the previous few months.

Durable Goods Again—Most of the decline is in the durable goods sector. New orders in January were off \$3.8 billion from a year ago. This is more than a 26 per cent decline.

The seasonally adjusted rate of new orders shows January business off 3 per cent from December for all manufacturing, with orders for durable goods off 7 per cent.

Backlog Cut—Unfilled orders totaled \$49 billion at the end of January, representing a \$1.5 billion reduction during the month. The report, from the Dept. of Commerce Office of Business Economics, says that declines were largest in machinery and transportation equipment industries.

In inventory cutbacks, durable goods again accounted for most of the change. Durable goods producers in January cut their stocks a full \$500 million. One half of this decrease occurred in motor vehicle and aircraft companies.

Hope for Capital Good

Investments Pay Off—Despite the discouraging decline in capital goods outlays, the trend to modernizing plants is not at all dead.

Under the gloomy state of mind that prevails today, excess capacity tends to draw all the attention. But that's only half the story. Most of the companies that invested heavily are now glad they did.

They don't like to make a lot of noise about it, but many of the new production facilities have a much lower break-even point. It is helping to ease recession pangs considerably in many cases.

Producers of capital goods are taking a little heart these days, even in view of the disappointing cutbacks in capital goods outlays. They realize the big expansion programs may be over for a time. But the premium on efficiency and low cost still exists.

Automation Works on Short Runs

Ford Makes Gas, Diesel Engines on Same Line

The notion that automated production lines lack flexibility is losing ground.

By integrating tractor engine designs, Ford is proving otherwise.—By H. R. Neal.

■ Automation in manufacturing is often thought of as welding a company to a rather inflexible system.

It is common belief in industry that product runs must be long to justify heavy investment in automatic equipment. Companies who make

several similar products, but in short runs, are especially inclined to think this way. It isn't always the case.

The Real Problem—Adaptation to automation can be more a matter of product design and engineering than it is of product differences and short runs.

A good example of how one company tackled and solved the problem of making gasoline and diesel engines on the same automated production line is found at Ford Motor Co.'s Tractor and Implement Div.

Diesel Growth—In 1951 only 4.5 pct of wheel-type tractors produced in the country were diesel powered. By 1955 this figure had jumped to 12.6 pct. Last year some 15 pct of U. S. wheel-type tractors were produced with diesel power.

Ford, the No. 3 tractor maker in the U. S., is also the leading diesel-powered tractor maker in the world, but its home-grounds showing was not nearly so impressive as its showing elsewhere.

Tooling Obstacle—The reason? It's only diesel has been the Fordson Major tractor, made in Great Britain. It's a large tractor, and not always competitive with smaller sizes offered by Ford's competitors. But tooling for a new engine is expensive, particularly if volume is comparatively small.

Usually, diesel engines are also bulkier than their gasoline cousins. This calls for design changes to the tractor itself, adding to the cost headache. So what did Ford do? They brought out Ford's first American-made diesel products—a new line of tractors for farm and industrial use—with suggested retail prices only \$395 above gasoline tractor prices. This compares with the normal premium of \$550 to \$850 for diesel tractor power.

How Ford Did It—According to R. J. Miller, chief engineer in the product engineering office, they started in 1955 to accomplish three major objectives.

First consideration was given to confining the exterior dieselizing components within the chassis envelope. This would permit installation of existing sheet metal without modification and would provide for

Wheel Balancing: New Job for Electronics



DELICATE BALANCE: A new electronic device being used by Pontiac to balance wheels is so sensitive that a burnt match placed on a tire will indicate need for weight adjustment. Heart of system is shown (insert).



time saved is . . .

money earned

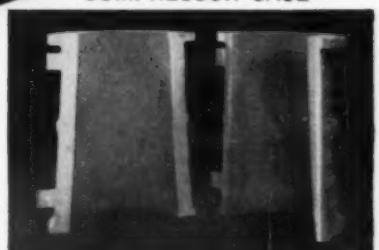
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The application of Bullard Man-Au-Trol Vertical Turret Lathes, Model 75, to the machining of aircraft turbine compressor cases clearly demonstrates the superiority of automatic operation.

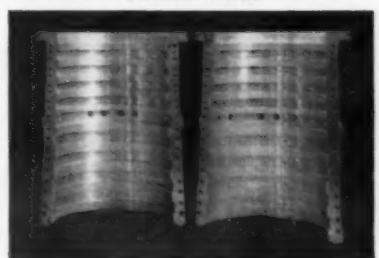
According to Mr. George E. Saupe, Chief Manufacturing Engineer at Solar Aircraft Co., San Diego, California, these are some of the advantages:

- 1 Spoilage practically eliminated.
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- 3 In process inspection unnecessary.
- 4 Better production control.
- 5 Reduces error of the operator.
- 6 Less work in process inventory.

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Available in range 1/8" P.D. to 6" P.D. 12" face maximum ground from 120 D.P. to 4 D.P. with pressure angles of 14 1/2°, 20°, 22 1/2°, 25°, or 30°.

Delivery on any quantity of precision or custom gears can be arranged to meet your production schedules. Whatever the quantity, you'll find that each gear has a uniform accuracy that insures maximum dependability and eliminates rejects.

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Automotive Production

WEEK ENDING	CARS	TRUCKS
March 15, 1958	87,900	15,520
March 8, 1958	83,892	17,523
March 16, 1957	141,038	20,866
TO DATE 1958	1,054,300	188,960
TO DATE 1957	1,522,700	231,950

*Preliminary

Source: Ward's Reports

use of presently designed front mounted loaders, cultivators and other equipment.

The second goal was to achieve "strong competitive performance characteristics." This was to be accomplished with the least possible deviation from present gasoline engine design.

Into Production—Third objective was to fully utilize the same automation equipment used to produce the Ford gasoline engine. The result of this would be high volume, low cost diesel engine production.

The result is an example of close working relationships between product design engineers and manufacturing. Through evolution they were able to adapt a second product to the same automation equipment—transfer machine lines and assembly tools.

Parts Interchangeable—The gasoline engine block is used for the diesel; bore diameter is the same. A larger flywheel, required for the diesel, is used in both. Cylinder head is set on with more studs to hold up under the diesel's 16 to 1 compression ratio, compared with 7.5 to 1 for the gasoline engine; it simplifies drilling operations.

A Roosa diesel fuel injection pump system was developed in a small, compact unit that includes the governor. It is seated on the distributor mounting for the gasoline engine.

Switching Tools—Because of the additional similarities designed into both engines, diesel and gasoline engine blocks move through the same transfer machine lines. The same is true for the cylinder heads. While the diesel head is entirely different,

machining is done on the same equipment plus two additional milling and reaming operations.

As detail differences require tooling changes, parts are scheduled in runs long enough to justify time and cost of the changeover. But these latter figures have been trimmed considerably over what might be expected. An entire tool changeover from production of one engine to the other can be made in less than 16 hours with the regular crew.

No Assembly Problem—Setting up for a run of diesel blocks and heads requires closer attention to tolerances. Spacing of the injection pump and camshaft lines relative to the fuel injection pump drive are held to closer tolerances for the diesel. And, while the injection pump is driven just like a gasoline engine's distributor and uses the same hole, the hole must be machined more precisely.

Assembly operations don't pose any special problems. Gasoline and diesel engines are intermixed on the same final assembly conveyor. Both

go through similar run-in tests after assembly. The one difference, natural gas is used for gasoline engines, fuel oil for diesels.

Search for Better Brake Linings

In the past 10 years, as automobiles have grown larger, their wheels have become smaller. The combination has posed problems for brake engineers: how to cut down on heat buildup, loss of braking due to fading, and yet improving lining life.

One development is a new "segmented" brake lining with greater fade resistance than conventional linings. Principle difference from conventional organic or asbestos linings is replacement of a 3-in. segment at the top of each brake shoe with sintered bronze.

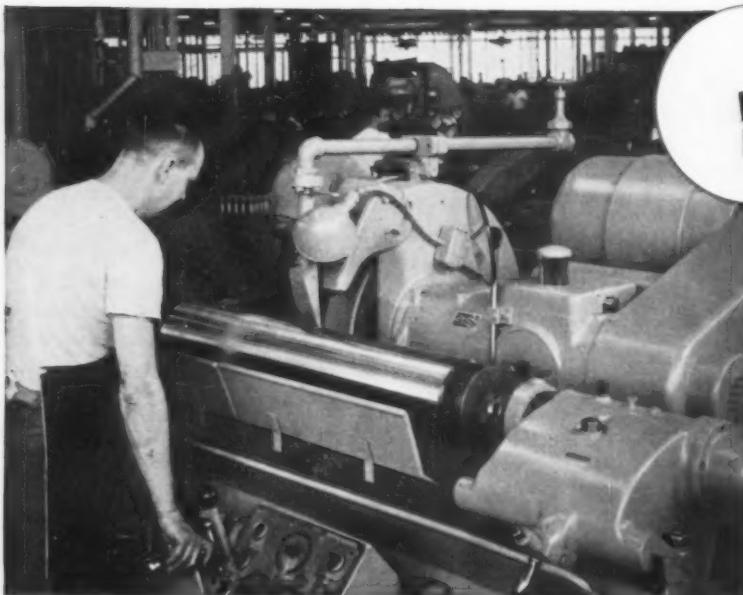
Small Cost Difference—Greater wear and heat resistance results. Its designers point out that segmented linings could be made with little change in present method and at only slightly higher cost.

THE BULL OF THE WOODS



Cincinnati Filmatic 16" Plain Grinders

Quickly give your large cylindrical work...



Flame hardened radial drill columns, requiring an extra high quality surface finish and precise accuracy, are ground on this CINCINNATI FILMATIC 16" x 72" Plain Grinding Machine.

Rapid stock removal of metal is fine for production. But it often works a hardship on surface finish, especially for precision cylindrical grinding operations. CINCINNATI FILMATIC 16" Plain Grinders have changed this relationship . . . these machines grind away excess stock at an amazing rate, and then with no extra attention whatever they finish to final size and produce an extra high quality surface. The 16" machine and its companion 14" size are well equipped to grind heavy precision work at the lowest cost.

FILMATIC grinding wheel spindle bearings will last the life of the machine; they automatically adjust for load (rapid stock removal of metal). Automatic grinding wheel balancing. Formerly a time-consuming chore; perfect balance now accomplished in a few seconds while the machine is running.

Finger-tip selection of table traverse rates; infinitely variable, electronically controlled.

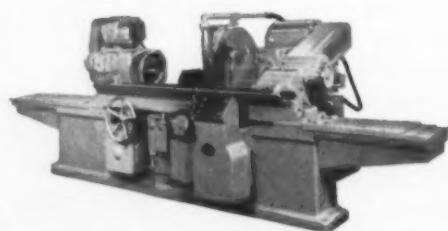
Automatic lubrication of ways and principal units.

Ample power for rapid metal removal . . . 20 hp spindle drive; 2 hp headstock drive (16" machine).



CINCINNATI FILMATIC 14" and 16" Plain Grinders offer many additional advantages for shops concerned with grinding large cylindrical work. Get all the facts. Brief data in Sweet's Machine Tool File, and complete data may be obtained by writing for catalog No. G-607-1.

CINCINNATI FILMATIC 16" x 48" Plain Grinding Machine. Brief data for both 14" and 16" sizes tabulated below. Get complete information by writing for catalog No. G-607-1.



Size	Spindle Drive	Headstock Drive	Lengths between centers
14"	20 hp	1 1/2 hp	36, 48, 72, 96, 120, 144, 168"
16"	20 hp	2 hp	36, 48, 72, 96, 120, 144, 168"

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House Eyes Foreign Aid Waste

New Requests Will Get Extra Close Scrutiny

GAO testimony about waste in administering foreign aid projects arouses committee.

Result will be a double check to make sure new requests are justified.—By G. H. Baker.

■ Evidence of waste of U. S. overseas aid money is stirring up new resentment in Congress. The complaining testimony comes largely from the independent—and influential—General Accounting Office.

The House Appropriations Committee as a result, is telling the GAO to keep the investigation going, and is planning to regard all requests for extra foreign-aid money with a fishy eye.

Where It Goes—The U. S. spends about \$8 billion a year on foreign aid. About half of it goes for military assistance (planes, guns, small arms, ammunition, supplies for troops). Balance goes for so-called "economic aid," which includes all assistance projects not directly related to military aid. This other \$4 billion covers schools, highways, water and sewer works, foodstuffs, civilian vehicles, and medicine.

The GAO is not concerned with judging if foreign aid is needed or not. As an accounting office, it is interested only in whether or not the U. S. taxpayers get what they pay for. Unfortunately, there is much waste in the foreign aid program.

Don't Always Care—Equipment is often left unattended and unwarehoused, subject to pilferage, corrosion, and wholesale theft. U. S. supply officers often don't know what they have in inventory—and some give the impression that they don't care.

The House Appropriations Committee is telling the GAO to step up its investigation. Branch offices of the GAO are being set up in Japan and other Far Eastern centers.

What angers many congressmen is that the Administration presents its foreign aid plans to the Congress each year with the assurance that "this is a tight, lean budget." (This isn't always the case, unfortunately.

Missiles for NATO

Conventional arms are giving way to guided missiles in the U. S. program for supplying military equipment to Western Europe.

Countries in the North Atlantic Treaty Organization are sent more missiles and fewer jet planes this year, Congress is told. Defense Dept. spokesmen tell the lawmakers

that the set-up in buying the newer weapons for NATO nations will continue. By mid-1959, these missile orders are to total more than \$660 million.

Renegotiation Act

Congress is being urged by the White House to extend the Renegotiation Act again past its scheduled expiration next Dec. 31.

The extension, President Eisenhower says, is needed "in the interest of holding procurement costs to a minimum" in the expanded national defense program.

The 1951 act has resulted, according to the Renegotiation Board, in refunds and price reductions of almost \$1.3 billion since it was adopted.

Keep Smiling, Ike Tells Them

He's Annoyed—Orders are out from the White House to all Administrative officials: Stop bleating about the recession and start selling confidence and self-help to the public.

Ike is openly annoyed with his Cabinet officers and other top lieutenants over some of the "gloom-and-doom" talk that's going around.

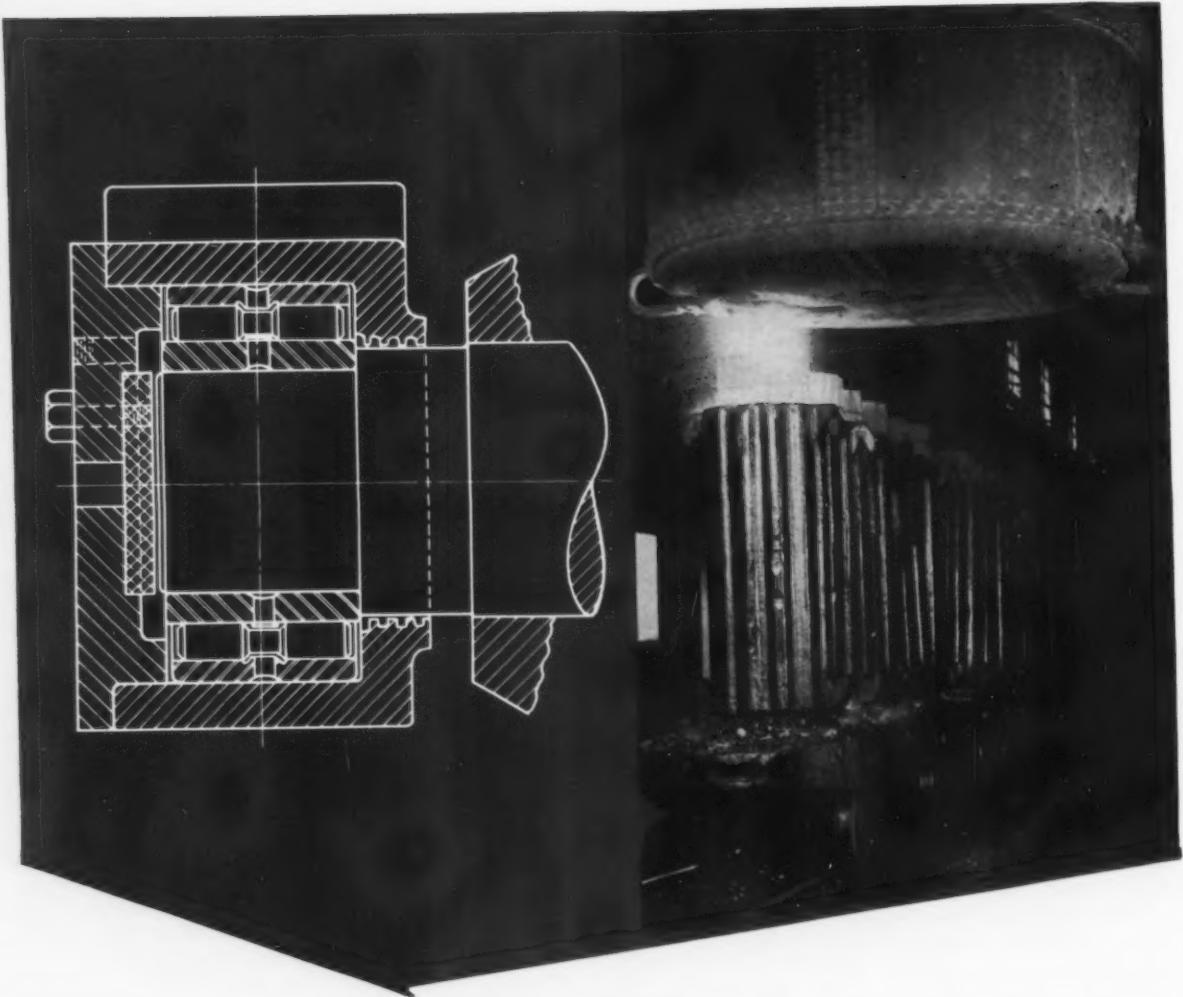
Confidence Needed—Nothing is to be gained by wailing over the current lack of industrial orders, he declares. What all executives—both in government and in business—should be doing is generating some confidence so as to stimulate new orders, he says. Mournful talk only makes things worse.

Might as well recognize that today's markets are buyers' markets,

the White House orders continue. This means both industrial commodities and consumer products. Instead of moaning about this fact of economic life, recognize it and learn to live profitably with it, the chief executive says.

Talk Alone Can't Do It—You can expect to find this more optimistic tone running through more and more of the speeches made by top Administration officials in the weeks ahead.

True, it's impossible to talk our way out of a depression. But Ike's reasoning is that some cheerful speeches will at least restore some buying confidence to consumers so as to stimulate sales of new homes, automobiles, and some other consumers hard goods.



Bearings, Inc. engineering service ... solves another bearing problem

Ingot mold cars for a large tube mill were continually out of service due to the short life of babbitt, bronze or other bearings originally supplied in the cars.

The Trouble? Bearings, Inc. engineers found shock loads far beyond the capacities of the original bearings. Extreme wear on bearings due to excessive skewing, bent axles and uneven track.

The Answer. Shown above is the Bearings, Inc. drawing of the installation that replaced the original bearings. It has greatly increased load capacity and no dimensional change is required in the shaft or bearing housing.

The Result. The new bearing is designed on a new prin-

ciple that keeps rollers in line and eliminates skewing. Shock loads due to uneven tracks have little effect on our installation for its construction makes possible a greater number of rollers available to support the load at all times.

This is just one of the many such problems we have solved for our customers. In all cases we supply only bearings we are authorized to distribute. They are new and come to you fresh in the manufacturers' boxes.

If you have a bearing problem or need replacement bearings in a hurry — call or write our branch nearest you, they're ready to give fast service.

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and

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WEST VIRGINIA: Charleston • Huntington • Parkersburg • Wheeling • NEW JERSEY: Camden
NEW YORK: Buffalo, Belenrol Corp. • MARYLAND: Baltimore • DELAWARE: Wilmington

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INCORPORATED

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N. CAROLINA: Charlotte • Greensboro • S. CAROLINA: Greenville • TENNESSEE: Chattanooga • Kingsport • Knoxville • Nashville

THE IRON AGE, March 20, 1958

How to Get Defense Contracts

Coast Survey Provides Tips, Lists Problems

You can't sit in your office and wait for defense work to come to you.

Previous experience is a big help. Survey also indicates SBA could help out more if it worked at it.—By R. R. Kay.

■ How to get more military work. That's a problem irking small business on the Coast.

It's a big problem, too. The Far-western states probably have, percentagewise, more small metalworking firms than any other section of the country.

The Complaints — Why don't they go after direct military contracts? Here are their beefs:

- (1) There are too many competitors to justify the effort.
- (2) Bid preparation is too costly.
- (3) Bidding procedure is complicated.
- (4) They don't know how to get proposals for work on which they're qualified.
- (5) They don't get specifications soon enough to prepare bids.

These gripes came to light in a survey made by the Strategic Industries Assn., Los Angeles. It polled 1000 independent firms doing defense work, largely as subcontractors.

Survey Results—How do some small firms manage to get direct defense contracts? They use a combination of methods. The survey shows that half of them get proposal bids without soliciting. They did military work before. About 40 pct have representatives making regular calls on agencies, and 34 pct say they submit sealed bids to advertised opportunities.

One company in fifteen of the entire 1000 polled relies on the Small Business Administration to keep it up-to-date on what's needed. Only 500 of them ever asked for SBA help. Of those, better than half say they were asked to bid. And if you're registered with the agency it's a one to twelve shot you'll get a contract.

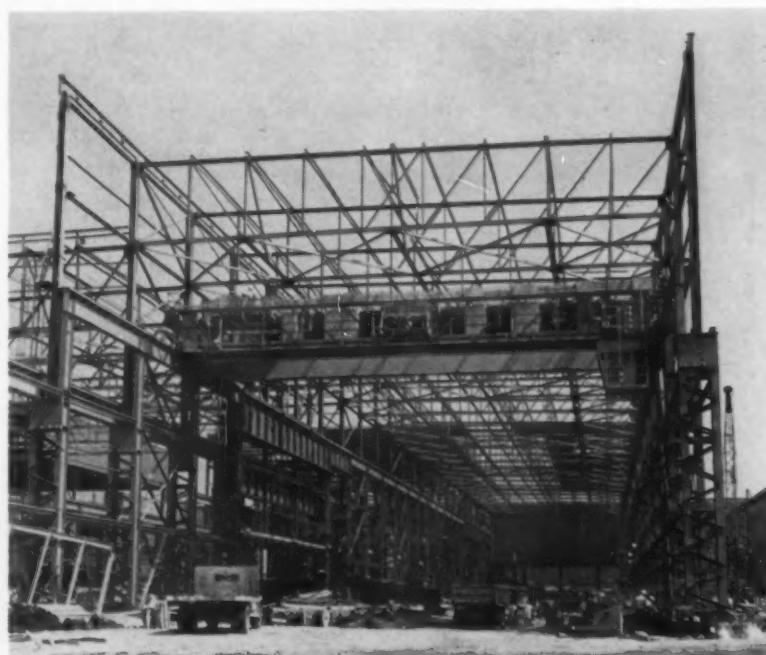
Go After It—From all this two things are pretty clear. If you want military work, you just can't drag your feet. You must go after it aggressively. And the SBA should step-up its missionary work. It has to plug its services harder. It's got

to make very clear how and where small business can get contracts.

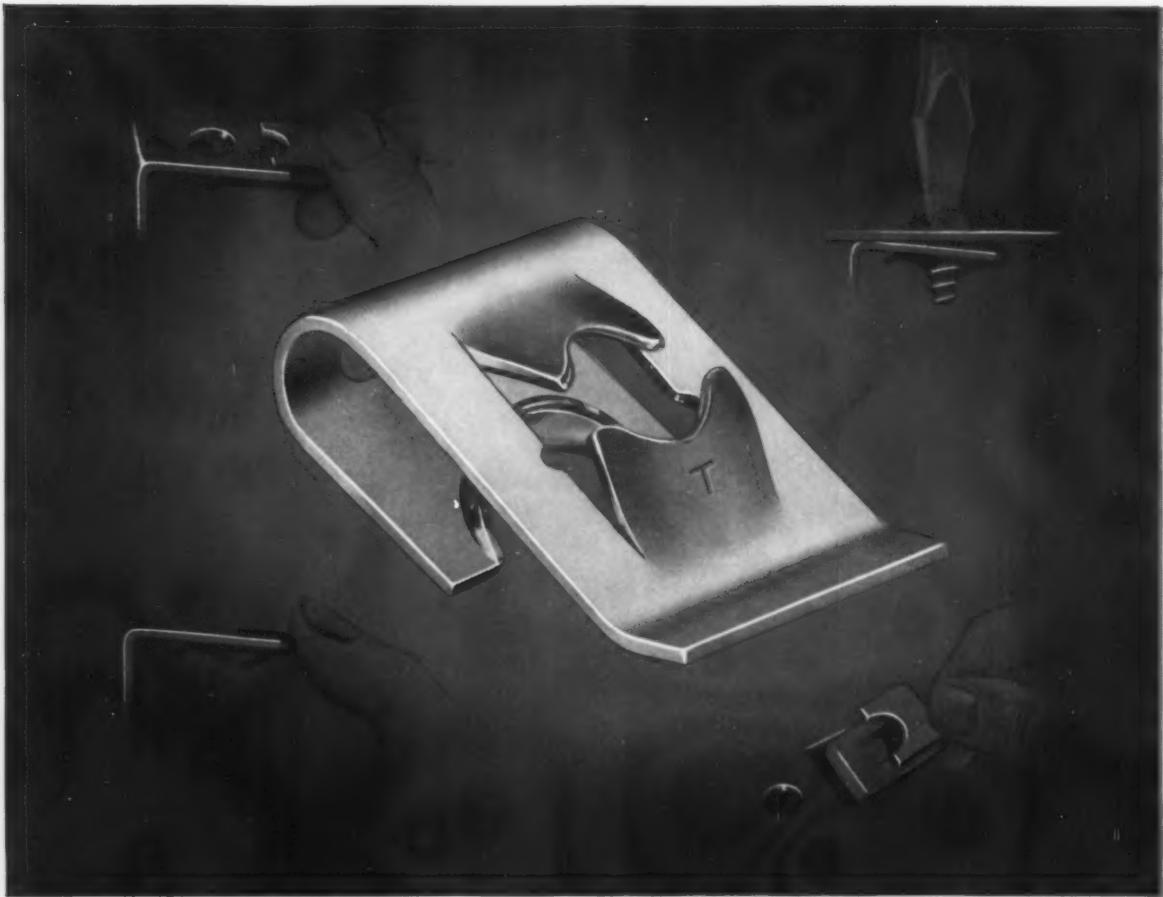
Incidentally, just four out of the 1000 companies say that a government buyer ever hinted to them for "something under the table." Only 3 pct favor taking him night-clubbing. Not one firm feels it has to do big-scale entertaining, such as a week-end trip.

One-third claim you don't have to entertain government people at all to get business. However, 55 pct have a different viewpoint on this. They feel that an occasional lunch or dinner can often be a very good idea.

More Steel for Coast Growth



GOING UP: New slabbing mill at Kaiser Steel's Fontana plant begins to take shape. It's part of Kaiser's current expansion program.



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If you are worried about rising assembly costs, let one-piece "U" and "J" SPEED NUTS keep costs down... and improve your product.

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SPEED NUTS are ideal for blind assembly or hard-to-reach locations. Apply them *before* you paint panels without danger of paint-clogging. Or *after* porcelainizing, without damage to finishes. The "U" type is similar to the "J" type, shown above, but is used where full bearing surface on the lower leg is required.

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Will '58 Tool Business Top '57?

AMTDA President Says the Odds Are Good

Frank H. Habicht tells distributors to take the long-range view despite the slow start this year.

Sales plans must be geared to an expanding economy.

Sales of \$1 billion in a normal year is "not too far off."—By E. J. Egan, Jr.

■ Despite their slow business start this year, machine tool distributors' new order volume in 1958 could top the 1957 total.

American Machine Tool Distributors' Assn. President Frank H. Habicht told members at the 34th Spring Meeting that "renewed enthusiasm" could turn the trick.

Cautious Optimism—"While attending regional meetings I talked with distributors and customers in many different parts of the country," Habicht said. "Everywhere I got the feeling of cautious optimism."

What Habicht considers the greatest potential for new business this year is "the dire need of all manufacturers to beat the price-cost-profit squeeze, and obtain higher levels of output per man hour."

AMTDA's president feels that although new orders have been down in the past few months, "we can't

Gear Business Up

January business perked up a bit for U. S. gear manufacturers. The American Gear Mfrs. Assn. Index of business booked in January is reported at 175.4. That's an increase of 16.3 pct over the dollar volume booked in December, 1957.

just look at the short term." He reminded his audience: "As salesmen we must take the optimistic view and see to it that our selling plans are geared to an expanding economy."

Billion Normal—"The time is not too far off when \$1 billion of

sales will be considered a normal peacetime year for machine tools," Habicht said.

Among other meeting highlights was the disclosure that 83 pct of the nation's distributors now sell machine tools on time payment contracts.

The First Hundred Are the Hardest



■ Estimated to be at least 102 years old, this lathe is used for general repair work in a shop owned by Weston L. Hazeltine, Baraboo, Wis. It won its discoverer, R. C. Vandamme, of Chicago's E. L. Essley Machinery Co., first prize in the American Machine Tool Distributors' Assn. "Oldest Lathe in America" contest.

The machine's original bearings were cast iron, with a solid spindle.

Carriage holddown is a 100-lb lead weight suspended between the bedways. Bed and frame are of bolted construction. It was motorized in 1940, was probably run by water and steam power before then.

The contest proved many fine old tools are still making chips, but that they're obsolete beyond a doubt. None can produce quality work at the speed and low cost per piece that is possible with modern equipment.

INDUSTRIAL BRIEFS

Sayonara — General Electric's Industrial Heating Dept., Shelbyville, Ind., is constructing an annealing furnace for the Wean Engr. Co., Inc., Warren, O., in behalf of the Fuji Iron & Steel Co. of Tokyo. Annual production will be about 500 million lbs when the furnace is converted to its ultimate capacity. Furnaces of this type represent an investment of about \$1 million. It is scheduled for completion by October. Installation at the Fuji Hirohito Works is to be completed in mid-1959.

No Patty-Cake — A contract in excess of \$1 million was awarded the Food Div. of Baker Perkins, Inc., Saginaw, Mich., for automation machinery for a cake baking plant. The contract, placed by the Kitchens of Sara Lee, Inc., Chicago, is considered by Perkins the largest ever conceived for a cake baking plant. The equipment will automate three lines, coffee cake, chocolate cake and brownies, and cheese and pound cake.

It's Pure — Super purity aluminum is now available from Kaiser Aluminum & Chemical Sales, Inc., in ingot form. Aluminum ingot of 99.99 pct purity can be obtained in 6, 15, 30 and 50 lb sizes. It is being produced at the company's Mead, Washington, reduction plant.



"She's finished! By the way, where's Shorty?"

Capital Spending Not Dead — U. S. Pipe & Foundry Co., Birmingham, Ala., plans \$9 million in capital expenditures in 1958. A large part of this money will be spent in completing expansion projects at the company's steel and tube divisions in Burlington, N. J. Other spending will include completion of a new battery of 60 coke ovens and auxiliary equipment and the purchase of new coal lands in Tuscaloosa County, Ala.

Island Acquisition — Dravo Corp. has purchased the shops and land of Pittsburgh Screw & Bolt Corp.'s Graham Works on Neville Island for \$787,500. The property includes about 40 acres of land, 260,000 sq ft of shop floor space, and 7,000 sq ft of office floor space. Dravo already owns approximately 125 acres on Neville Island.

Exchange Agreement — Western Pneumatic Tube Co., Kirkland, Wash., and Superior Tube Co., Norristown, Pa., will exchange technical and marketing information. Under the agreement, Superior will help Western Pneumatic get distribution of its products through warehouse distributors representing Superior in industrial centers throughout the U. S. and Canada.

To Bucks County — Wheeling Corrugating Co. has purchased a 7-acre tract of land in Bucks County, Pa., near Philadelphia, for future development. The company plans to erect a culvert manufacturing plant on the property. Wheeling Corrugated Metal Culvert Pipe is used in highway, railroad and airport construction. It is also used for smaller drainage jobs on farms, in the suburbs and in industry.

Modern Design — Walworth Co. has opened an aluminum-clad building in Glenshaw, Pa., a suburb of Pittsburgh. The building will house the company's Central Div.'s sales and distribution for the Pittsburgh area. It will serve customers in sections of W. Virginia, Ohio, New York, Pennsylvania, Maryland, Indiana and Kentucky.

To the Suburbs — The J. O. Ross Engineering Div., Midland-Ross Corp., will construct a new Chicago office building in suburban Mt. Prospect, Ill. Scheduled for completion in Sept. 1958, it will house engineering and office personnel for the midwest area. It will also include facilities for the Chicago personnel of the John Waldron Corp., a unit of Ross Engineering which manufactures web converting machinery and flexible couplings.

Up Periscope — General Electric Co., Lynn, Mass., and Westinghouse Electric Corp., Pittsburgh, have received fixed-price contracts from the Navy for the construction of propulsion machinery for four nuclear-powered submarines. The Westinghouse contract is for \$6,770,030. The General Electric contract is for \$6,786,280. Contracts are for propulsion machinery for 3 guided-missile, nuclear-powered submarines and one nuclear-powered submarine having an advanced hull design.

Changeover Boiler — The Babcock & Wilcox Co. will build and erect a boiler for Continental Oil Co.'s 52,000-barrel per day crude oil refinery at Lake Charles, La. The unit is designed to operate initially with conventional fuel and then switch over at Conoco's convenience to utilize hot gas turbine exhaust instead of air for combustion. This will enable the company to employ a gas turbine at the refinery and to reclaim and use the tremendous amount of heat in the exhaust gases.

Looking East — Mueller Brass Co., Port Huron, Mich., has purchased the outstanding stock of the American Sintec Corp., Yonkers, New York. Purchase includes machinery, equipment, inventories, patents, trademarks and trade names. The new subsidiary is engaged in the production of powder metal parts from various alloys in iron, steel, brass, bronze, copper, nickel and nickel-silver.

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M. M. Reed, elected president, International Div., Harris-Intertype Corp., and vice president of the corporation, Cleveland.

M. O. Ferrini, elected executive vice president - treasurer, Perkins Machine Gear Co., West Springfield, Mass.; **D. M. Taylor**, elected vice president, manufacturing; **M. H. Swift**, named vice president, engineering.



C. G. Bigelow, Jr., appointed director, research, Selas Corp. of America, Dresher, Pa.

C. E. Walsh, named president, Associated Iron & Steel, Inc., Richmond, Ind.

H. P. Troendly, elected group vice president, Borg-Warner Corp., Chicago.

T. S. Pacer, elected executive vice president, Illinois Gear & Machine Co., Chicago.



M. F. Coyne, named vice president, Gas Div., Victor Equipment Co., San Francisco.



F. L. Stettner, will become vice president, engineering - production, Victor Equipment Co., San Francisco.

W. J. Plate, appointed manager, Accessories Div., Anaconda Wire & Cable Co.

C. E. Stewart, appointed general attorney, National Tube Div., U. S. Steel Corp.

J. L. Marks, Jr., appointed assistant to administrative vice president, research and technology, U. S. Steel Corp.

R. T. Stafford, appointed general manager, Seattle steel service plant, Joseph T. Ryerson & Son, Inc.



S. P. Curtis, appointed chief engineer, Central Operations — steel and coal, U. S. Steel Corp.

MEN IN METALWORKING

J. L. Arthur, elected vice president, sales, Calstrip Steel Corp., Los Angeles.

W. H. Shorter, Jr., elected vice president, Emhart Mfg. Co., Hartford, Conn.; **J. W. Murray**, named manager, research, development and engineering.

J. R. Scott, appointed asst. manager, sales, Chicago, U. S. Steel Corp.; **J. G. Brooks**, promoted to manager, sales, Indianapolis.

W. J. Califf, Jr., appointed manager, reinforcing bars, Connors Works of Connors Steel Div., H. K. Porter Co., Birmingham, Ala.

LeGrand Terry, named district manager, Mobile Section, Detroit office, Vickers Inc.



C. F. Stugard, elected vice president, Cincinnati Milling & Grinding Machines Inc., sales subsidiary of The Cincinnati Milling Machine Co.

Following appointments are within the Denison Engineering Div., American Brake Shoe Co., Columbus, O. **Don Arnold**, promoted to manager, Detroit office, Birmingham, Mich.; **J. W. Lindsay**, appointed Cleveland district manager; **H. R. Brumleve**, named field engineer, Pump and Control Sales Div., Detroit district office; **L. M. Krebs**, appointed field engineer, Multipress Div., Detroit office; **D.**

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Show, April 15-17, 1958

R. Clague, named sales representative, Pump and Control Div., Cleveland territory; **R. C. Lawrence**, named field engineer, New England and New York.



E. A. Murray, named asst. vice president, sales, American Steel & Wire Div., U. S. Steel Corp.

F. E. Pringle, named general sales manager, Howe Scale Co., Rutland, Vt.

Stanley Grossman, appointed steel warehouse manager, Eastern States Steel Corp., East Bridgewater, Mass.

F. D. Atkins, appointed asst. general manager, Los Angeles plant, Bethlehem Pacific Coast Steel Corp.



W. F. Boyle, vice president, named general manager, Hamilton Div., Hamilton, O., Baldwin-Lima-Hamilton Corp.

O. G. Stewart, appointed executive engineer, mining, Electro Metallurgical Co.

N. F. Moody, appointed district manager, Philadelphia, and **H. F. Colt, Jr.**, appointed district manager, Boston, Air Reduction Sales Co.

W. D. Marshall, appointed assistant to product manager, Electrical Mfg. Div., The National Acme Co., Cleveland, O.

L. J. Willner, appointed manager, Chicago area, Luria Brothers and Co., Inc.

F. P. Florentine, appointed manager, Phenolics Engineering Unit, General Electric's Chemical Materials Dept., Pittsfield, Mass.

A. F. Lovelace, appointed manager, trade relations, Kaiser Aluminum & Chemical Sales, Inc.

R. G. Considine, appointed sales engineer, Marine & Industrial Hardware Div., Brewer-Titchner Corp., Cortland, N. Y.



I. M. White, elected vice president and general manager, Pelton Div., San Francisco, Baldwin-Lima-Hamilton Corp.

F. A. Miller, appointed manager and **J. J. Brosky**, asst. manager, Grafton plant, Organic Chemicals Div., American Cyanamid Co., Grafton, Ill.

W. H. Matz, promoted to supervisor, quality control, Chemical Group, Pittsburgh Coke & Chemical Co., Pittsburgh.

H. M. Hutchison, appointed coordinator, supplemental unemployment benefit and unemployment



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compensation, Jones & Laughlin Steel Corp., Pittsburgh.

W. J. Harper, named chief mechanical engineer, Hanson - Van Winkle - Munning Co., Matawan, N. J.



Ludwig Zengeler, named vice president, NCG Div., National Cylinder Gas Co., Chicago.

S. B. Gamble, named sales engineer, specially designed furnaces, Rust Furnace Co., Pittsburgh.

L. J. Torn, promoted to chief engineer, Airborne Instruments Laboratory, Inc., Mineola, N. Y.

A. C. Kohnfelder, promoted to chief engineer, Pennsylvania Engineering Corp., New Castle, Pa.



D. G. Dutcher, appointed chief electrical engineer, Hanson - Van Winkle - Munning Co., Matawan, N. J.

J. R. Greaves, appointed sales representative, Joseph Dixon Crucible Co., Jersey City, N. J.

E. G. Guiles, named district sales manager, California, and **D. C. Hall**, named sales engineer, Tecler Aluminum Corp., Seattle, Washington.

J. R. O'Hara, appointed sales representative, die sales subsection, Metallurgical Products Dept., General Electric Co., Detroit.

P. M. Allen and **D. C. Perry**, promoted to senior research engineers, Research Div., Armco Steel Corp., Middletown, O.

H. C. Ashley, appointed metallurgical director, Chase Metal Works plant, Chase Brass & Copper Co., Waterbury, Conn.

W. R. Kegerise, appointed metallurgist, high temperature alloys, The Carpenter Steel Co., Reading, Pa.

T. R. Welch, becomes general manager, TC Components Div., Brubaker Electronics Co., subsidiary of Telecomputing Corp., Los Angeles, Calif.

Jack Speakman, named sales representative, Kansas City, Toledo Steel Tube Co., Toledo, O.



G. A. Pyle, appointed manager, stainless steel products sales, American Steel & Wire Div., U. S. Steel Corp.

Ludwig Anselmini, joins the staff, Stainless Steel and Heat Resistant Alloys Section, Development and Research Div., The International Nickel Co., Inc.

W. J. Brown, appointed staff product application engineer, Marketing Technical Service Div., Gulf

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- 30-Inch Motor-Driven
- 42-Inch Motor-Driven
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AUTOMATIC INDEXING

- 42-Inch Horizontal

NUMERICALLY CONTROLLED

- 42-Inch Horizontal



TLTING ROTARY TABLES

- 10-Inch Hand Operated
- 16-Inch Hand Operated
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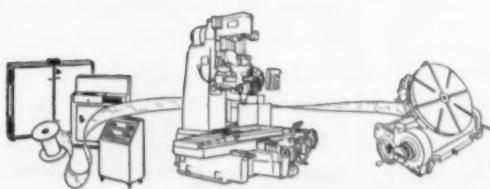
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Research & Development Co., research subsidiary of Gulf Oil Corp.

R. R. Hartup, appointed Pre-stress planning engineer, Leschen Wire Rope Div., H. K. Porter Co., Inc., St. Louis, Mo.

R. L. Leaf, appointed product development supervisor, Expanded Metal Div., Penn Metal Co., Inc., Parkersburg, W. Va.

Alfred Laverty, appointed chief chemist, Eastern Div., Wyman-Gordon Co., Worcester, Mass.

Rt. Hon. C. D. Howe, former Minister of Trade and Commerce of Canada, appointed to the board of directors, Aluminum Ltd.

Following salesmen have been added to the Latrobe Steel Co., Latrobe, Pa. They are: **Dave Bellis**, assigned to Philadelphia; **Bill Cornish**, Boston; **Dick Hughes**, Detroit; **Bob Rahm**, Chicago.

E. E. Saloum, promoted to chief engineer, Snap-Tite, Inc., Union City, Pa.

C. D. Hobson, appointed chief engineer, Goshen Rubber Co., Inc., Goshen, Ind.

R. J. Henderson, appointed asst. purchasing agent, tools and equipment, Endicott, N. Y., manufacturing plant, International Business Machines Corp.

J. V. Briner, appointed district sales engineer, Industrial Instrumentation Div., Texas Instruments Inc., Houston.

J. F. McKiernan, appointed general manager, Daybrook Hydraulic Div., Young Spring & Wire Corp., Detroit.

C. R. Riordan, promoted to asst. general manager, William Brand & Co., Inc., Willimantic, Conn.

Glenn Herz, named chief engineer, Hyster Co., Portland, Ore.

J. A. Erdle, appointed chief engineer, Johnson & Hoffman Mfg. Corp., Mineola, New York.

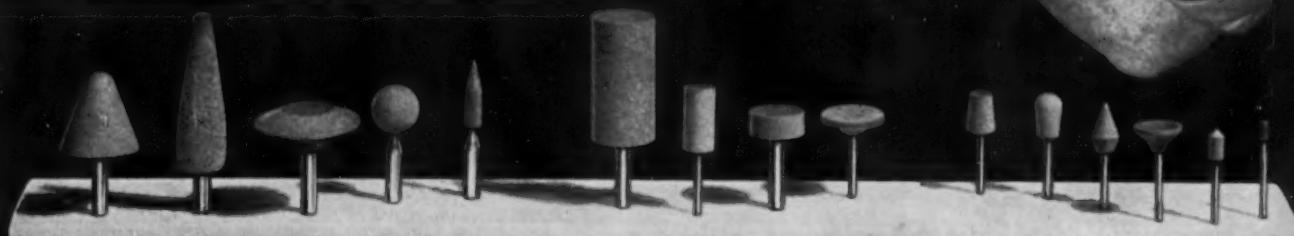
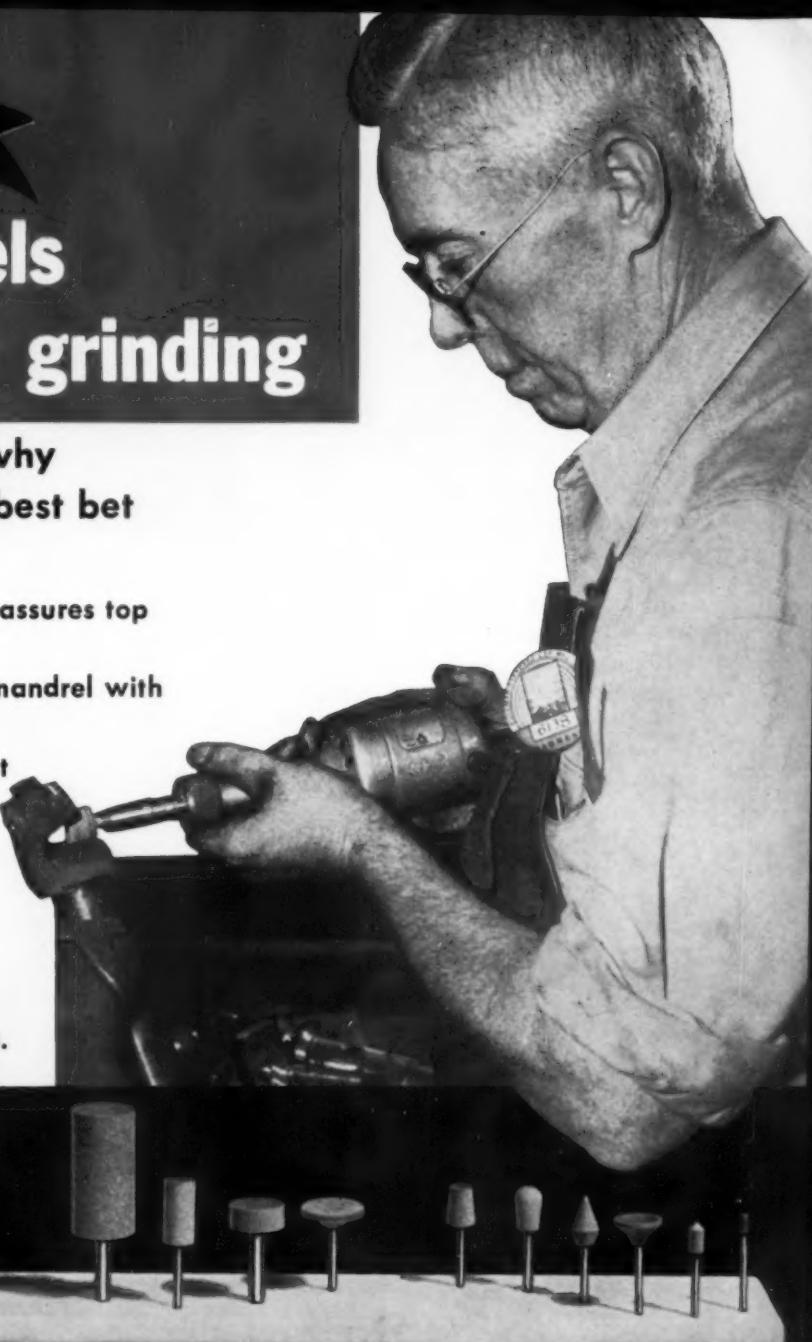
William Guy, appointed asst. chief engineer, Harris Calorific Co., Cleveland.

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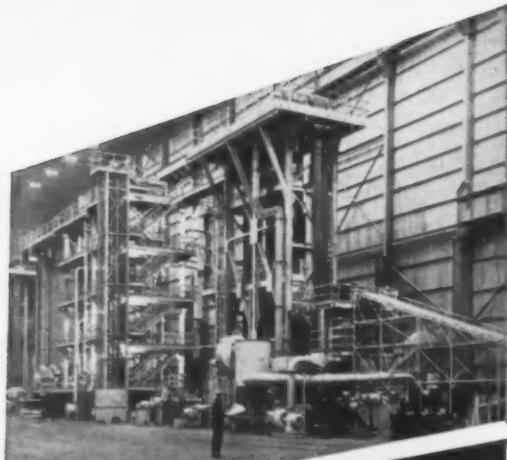
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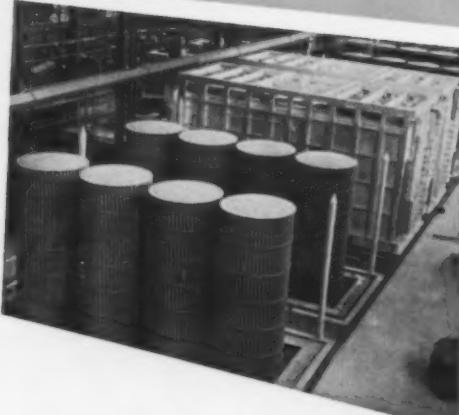


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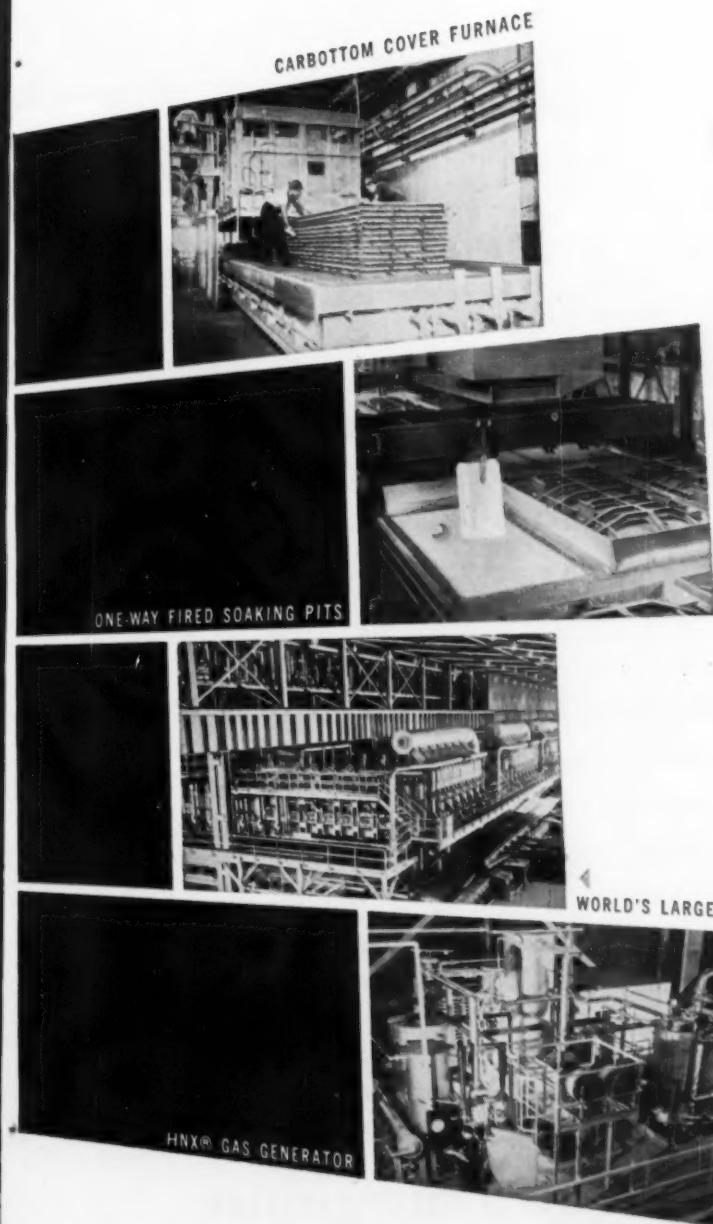
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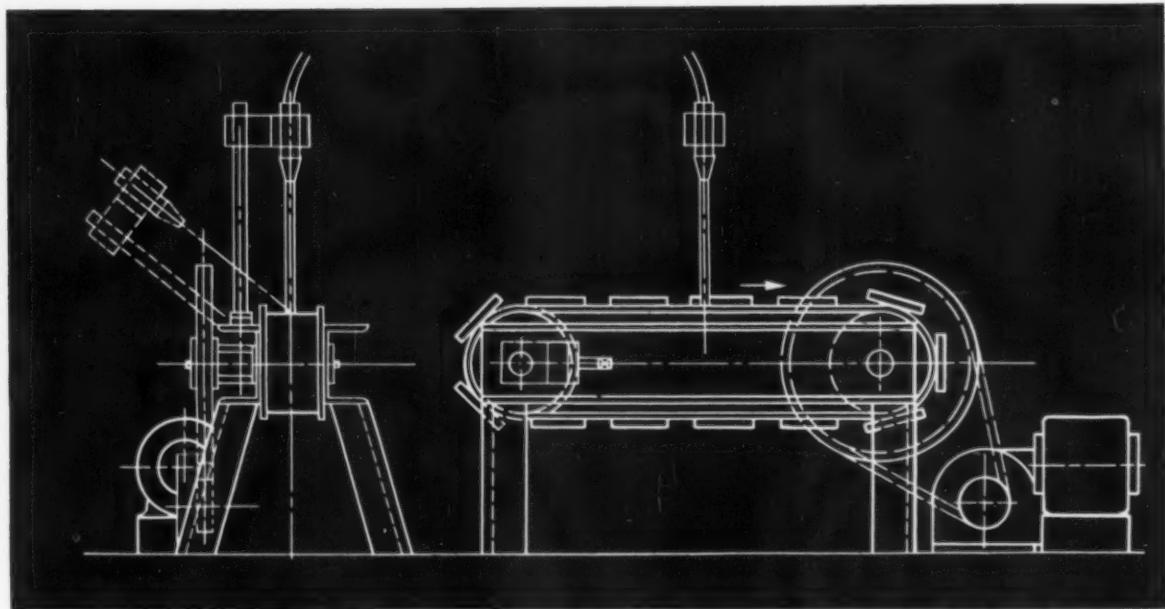


FIG. 1: Apparatus for sandblast tests has driven canvas belt to which samples are clipped.

Wear Resistance: Is Melting Point the Key?

By H. A. Unckel—

Finspong, Sweden

Wear occurs in a variety of forms, and about as many theories have been advanced to explain it.

This one takes a surprising turn in relating wear of seven common metals to their melting points.

■ Structural elements and machinery worth untold millions of dollars are destroyed every year by wear. And although a good deal has been done to determine the wear behavior of metals, this vital field still hasn't by far received the attention it deserves.

This may be due in part to the widely varying forms in which wear occurs. Eichinger,¹ for example, describes four types of metallic wear: boundary friction between lubricated surfaces; sticking together of rubbing surfaces, due to metallic contact and local welding; wear by formation of flakes in rolling friction; and oxidation effects of rubbing surfaces. Holm² considers the following forms: wear in rolling contact, wear due to hammering, wear caused by electric phenomena, and wear in sliding contact (frictional wear). Larsen and Perry³ report on the role of oxidation of the surfaces themselves, or of the lubricant and other kinds of chemical action.

Tests Use Sandblast — In the

present study, experiments on wear were made by sandblasting, abrasion with emery cloth and loose emery powder, and on metallic surfaces in sliding contact. Although metals aren't usually exposed to wear by sandblasting, this method might have value in classifying different materials. In special cases where dynamic effects are involved, as in handling or transport granular materials, the results of sandblast tests may even be directly applicable.

The test apparatus is shown in Fig. 1. It consists of two rolls with a belt stretched between them and driven at 40 fpm. In the sandblast experiments the belt was canvas, 4 in. wide and 1/5 in. thick. Specimens were plates 3x3 in. by 0.2 in. thick. They were fastened to the

belt by means of two clips opposite each other near the edge of the belt, through drilled and countersunk holes.

Vertical and Angled Jets—The sandblast nozzle was arranged at a distance 1½ ft from the specimens. One series of experiments was conducted with the sand jet impinging vertically and another with impingement at 45 degrees to the specimens. According to Wahl⁴ an inclined jet should bring out eventual differences in wear behavior better than vertical impingement.

Air pressure was 6 atmospheres and the sand had a grain size of 1.5 mm mean diam. One tankful of sand lasted for about 20 minutes blasting. Actual blasting time for each sample was, of course, somewhat shorter. Tests were run up to 10 such charges, the specimens being removed after certain times for weighing to determine metal loss.

Abrasion tests were made on the same device, except that Carborundum cloth in grain sizes of 50 and 150 was substituted for the canvas belt. Specimens were screwed to the holder shown in Fig. 2 and tested one at a time. Under the belt is a wooden support covered with sponge rubber 0.2 in. thick

and cloth. The shaft of the specimen holder is guided in a lubricated bushing attached to a vertical arm on the machine frame. The load consists of weights placed directly on the shaft.

Test loads, including weight of the holder itself, were 23.5, 10.7 and 7.6 lb. Tests were run up to 20 minutes, with the specimens being weighed at intervals. Each Carborundum belt was renewed before it became appreciably worn.

Varied Test Order—Care was also taken to expose all specimens to the same abrasive treatment; with every new belt the samples were tested in a different order. It was also done so that wear of any one specimen was the same if tested on a new belt or on a used one.

For the experiments with loose abrasive powder, Carborundum grain size 46 was used along with the same specimen holder and support. The belt in this case was steel strip 0.16 in. thick and 4 in. wide. Either water or machine oil was used as a moistener for the abrasive. New powder was spread on the strip at regular intervals.

Tests on metallic sliding action were made with the same arrangement but without abrasive; the steel

strip rubbed directly against the specimen.

Mostly Nonferrous—Materials tested were 99.5 pct commercially pure aluminum, both cold rolled and annealed; 24S alloy (4.5 pct Cu, 1.45 pct Mg, 0.6 pct Mn, balance Al) fully heat treated and aged as well as annealed; brass (72 pct Cu, 28 pct Zn); brass (63 pct Cu, 0.2 pct Pb, balance Zn); 99.8 pct pure copper; and commercial iron. The last four materials were both cold rolled and annealed.

Hardness before testing and surface hardness after sandblasting are given in Table I.

None of the specimens were specially surface treated. While anodizing normally increases the abrasion resistance of aluminum and its alloys, the very thin Al_2O_3 layer couldn't be expected to withstand the rough treatment of sandblasting, or abrasion with Carborundum.

In the sandblasting experiments, wear was proportional with time. As seen in Table I, vertical impingement causes greater wear than an inclined jet; in the latter case the sand grains conserve more of their kinetic energy on leaving the specimen surface than with a vertical jet. With the exception of 34S, the specimens in the soft, annealed condition wore slightly more than in the cold-rolled or the heat-treated state; but no difference obtains with the inclined jet.

Iron Does Best—Comparing the different metals and alloys, iron wears least, followed by copper and the 72-Cu brass. Aluminum and its alloys exhibit considerably higher wear and the leaded brass wore the most.

As shown in Table II, wear was also proportional with time in abrasion tests on Carborundum belt. With the coarse-grained belt, 72-Cu brass shows best resistance. Next in order of merit are copper, iron, leaded brass, and aluminum and its alloys. Annealed samples showed only slightly higher wear than cold-rolled ones.

Relative wear resistance was

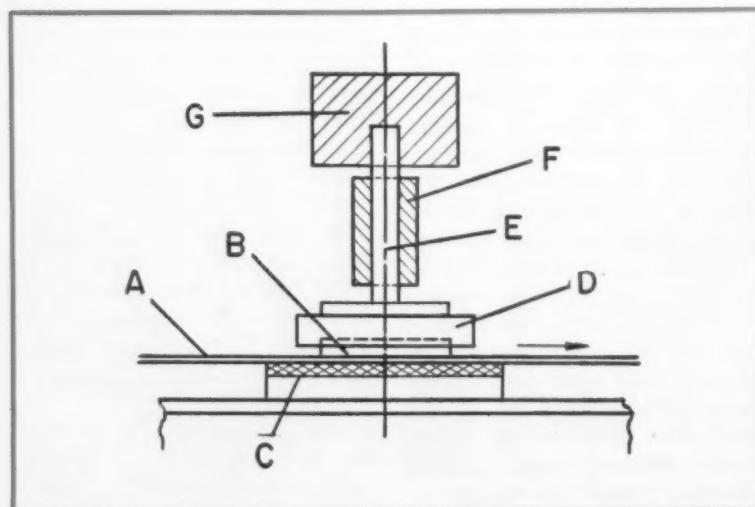


FIG. 2: For the other tests, an abrasive belt or metal strip (A) moves between the stationary sample (B) and cloth-covered sponge-rubber pad (C). Specimen holder (D) is fastened to shaft (E) guided by bushing (F). The load (G) is weights placed right on the shaft.

about the same in the fine-grained cloth series, except that iron behaved best. There is no clear difference between hard and annealed samples.

Order Again Changes—In the series with loose abrasives, Table III, the order of merit was somewhat different. With water as the moistener, 72-Cu brass, iron and copper behaved about the same. Leaded brass and the light metals showed lowest resistance. With oil moistener the order was iron, copper and 72-Cu brass; leaded brass and the light metals were considerably less resistant.

In both series no real difference between the hard and the annealed condition was found. Aluminum wears slightly more than its alloys.

The tests on sliding wear against steel strip weren't extensive enough to allow definite conclusions. As far as could be found, wear was about the same for the materials tested. At least, wear resistance of the light metals does not seem to be inferior to that of the heavy ones, perhaps because of the oxide film that forms.

Hardness Unimportant—The most striking feature of the sandblast tests is that hardness doesn't seem important to wear resistance. Cold rolled material is at best only slightly more resistant than annealed metal; fully heat-treated aluminum alloys were no better than in the annealed state, in spite of hardness being about double.

It has been proposed by Oberle⁵ that wear by sliding abrasion depends on the ratio of strength (represented by hardness) to elastic modulus. He attributes wear resistance to the amount of elastic deformation before plastic yield occurs, and a low modulus that increases the "give" of contacting surfaces and thus increases the elastic consumption of energy.

In the present case these arguments do not hold. Comparing, for example, the heat-treated aluminum alloys with commercial aluminum, both have very nearly the same

Table I | Results of Sandblast Tests

Material	Hardness, Bhn		Volume Loss, cu in. x 10 ⁵			
	before	after	10 runs	4 runs	7 runs	10 runs
Aluminum, rolled	36	38	12.7	1.9	3.9	5.9
annealed	23	35	15.4	1.6	4.1	6.3
24S alloy, heat treated	104	159	14.9	2.9	5.3	7.2
annealed	62	81	12.2	2.9	4.6	6.5
57S alloy, heat treated	121	159	11.4	2.4	4.5	6.3
annealed	42	65	12.1	2.1	4.0	5.9
72-Cu brass, rolled	110	179	7.6	1.3	2.7	3.7
annealed	57	159	9.0	1.4	2.6	3.4
Leaded brass, rolled	164	191	—	4.0	9.1	12.0
annealed	76	159	—	3.4	7.6	10.1
Pure copper, rolled	120	135	6.5	1.2	2.0	3.4
annealed	48	104	9.5	1.3	2.2	2.7
Iron rolled	142	169	5.2	1.1	2.2	2.8
annealed	110	155	6.3	1.2	2.1	2.7

Table II | Abrasion Tests With Carborundum Belts*

Material	Volume Loss, cu in. x 10 ⁵		
	Coarse-Grained	Fine-Grained	5 minutes
Aluminum, rolled	3.8	8.8	1.6
annealed	3.7	9.3	1.5
24S, heat-treated	4.3	9.5	1.1
57S, heat-treated	4.0	8.3	1.1
annealed	3.5	8.0	1.1
72-Cu brass, rolled	0.9	1.7	0.6
annealed	0.5	1.8	0.4
Leaded brass, rolled	1.6	3.6	1.1
annealed	3.3	6.0	0.7
Copper, rolled	1.2	2.6	0.7
annealed	1.0	3.1	0.6
Iron, annealed	2.4	4.4	0.3

* Load of 23.5 lb equals 2.6 psi.

elastic modulus, very different hardness, but about the same wear resistance.

Or, compare 57S alloy with annealed iron, both having about the same hardness. The elastic modulus of iron is 29,000,000 psi, roughly three times that of the aluminum alloy; but wear resistance of the iron is much higher than that of the light metal.

Fatigue Isn't Decisive—According to Eichinger fatigue strength is a factor. In the present case, however, it can't be decisive. The fatigue strength of annealed commercial aluminum is 5700 psi—about $\frac{1}{3}$ that of heat-treated 24S alloy. But both materials exhibit the same wear resistance.

A combination of hardness and toughness might explain why iron,

copper and 72-Cu brass are more resistant than the light alloys. But leaded brass showed least resistance, although hardness and toughness are not too different from those of 72-Cu brass. Further, hard rolled aluminum and heat-treated aluminum alloys have about the same toughness, very different hardness, and the same wear resistance.

Thus, all the properties discussed fail to give a clue to the different wear behavior or the mechanism of wear. The answer appears to lie in a rather surprising direction—namely, the relative melting point of the different materials.

Data Supports Theory—Wear is roughly proportional to the inverse of the absolute melting point: for iron, 2802°F; copper, 1981°F; brass, 2100°F; aluminum, 1220°F

and aluminum alloys, about 935°F. Leaded brass is an exception.

Bowden and Tabor* say that in polishing of metals, local melting actually occurs at the point's contact. For polishing action to be possible, the polishing medium has to have a higher melting point than the metal to be polished. Relative hardness is unimportant.

In sandblasting, a high temperature is generated at the points of contact. Specific pressure at the impact of sand grains becomes very high and metal fragments are carried away, either in the molten state or at a high temperature where strength is low. The lower the melting point the greater the volume torn away by each grain.

Annealed By High Heat—This explains, too, why heat treated aluminum alloys behave the same as annealed samples; the effect of heat-treatment disappears at the high temperature. Likewise, as rolled hardness vanishes at the point of contact.

The fact that rolled material showed slightly better resistance might be explained by less indentation. Of course, it can be argued that hard and soft specimens act the same because impact of the grains effects very considerable work hardening. The author believes however, that local heating in the outermost surface layer is the dominating factor. There must be a sharp temperature gradient;

otherwise the extreme strain hardening in adjoining layers wouldn't be possible.

Lateral movement of hills and valleys under continuous impact of the grains leads to local fatigue and particle loss, so it's also a contributing factor. Thermal conduction doesn't enter into sandblasting because the process is so fast.

Why Not Leaded Brass?—Unlike the other materials, leaded brass has a two-phase structure with lead particles embedded in an alpha-solid solution matrix. In this type of alloy, lead is added to improve machinability by causing the chips to break up.

In the case of sandblasting, lead particles act as stress raisers and facilitate tearing off of bigger brass fragments. Moreover, it may be that the lead, having a very low melting point, is molten in a thicker surface layer, making it easier for sand grains to tear off larger brass particles.

In the tests with Carborundum cloth the wear mechanism is somewhat different from that in sandblasting, and is influenced by factors other than local heating or melting. Relatively slow motion of the abrasive belt brings heat conductivity of the material into play and this effect superimposes on that of local heating. This is why the 72-Cu brass and copper show higher resistance than iron, and why leaded brass in relation to the other ma-

terials shows better resistance than in sandblasting.

Ploughs Deeper—In the tests on coarse Carborundum belt the annealed samples are slightly but definitely less resistant than the hard ones. This may be explained by the deeper ploughing action of the coarser grains; toughness of the material will be of some importance, which would explain the superiority of 72-Cu brass over copper.

As in the sandblast tests, the light metals don't show a clear difference between various grades. Annealed aluminum suffers the same wear as hard rolled material, and heat treated alloys behave like the annealed ones; this is mainly a result of local heating to high temperatures in abrasion.

Iron was best in the tests on fine grained Carborundum. This indicates that local melting or softening predominates over the machining action.

With loose powder, as in the tests on Carborundum belt having about the same grain size, local melting or softening prevails over the machining action. The finer the powder the more numerous the number of contact points and the more wear will be confined to the very surface layer itself.

Force Lessens—The main difference between the action of abrasive cloth and loose abrasive powder is that loose grains have a certain freedom to roll; the force transferred by them will be less than with bound grains, so ploughing action is also lessened. Hardness on the abraded surfaces increased much less than in sandblasting.

Table III | Abrasion Tests With Carborundum Powder*

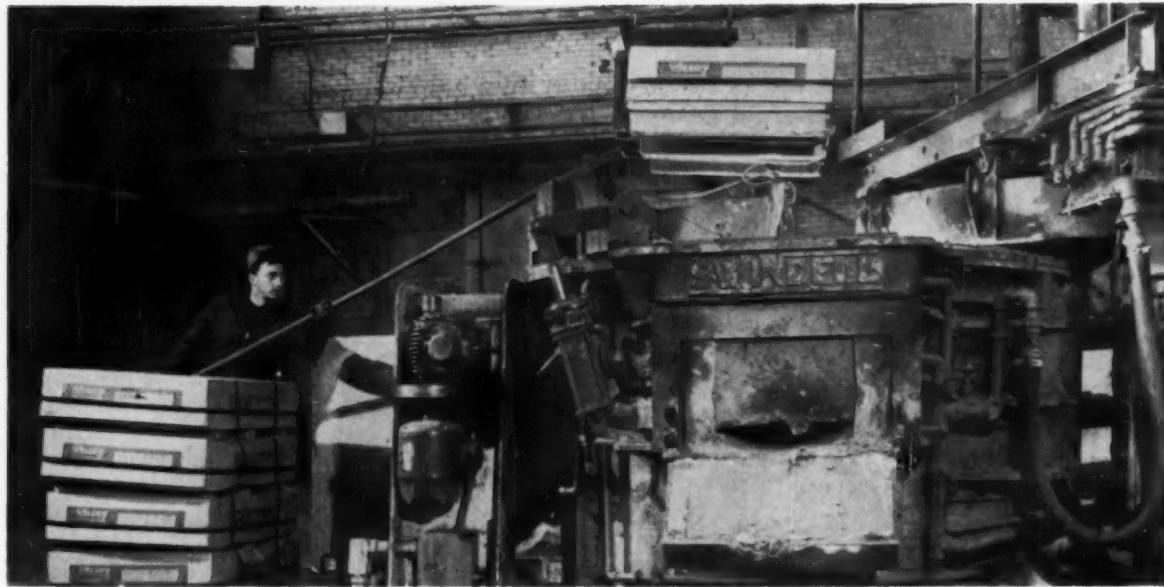
Volume Loss, cu in. $\times 10^5$

Material	Moistened With Water		Moistened With Oil	
	30 minutes	15 minutes	30 minutes	45 minutes
Aluminum, rolled	0.8	1.0	1.8	3.0
annealed	0.8	1.3	2.3	3.5
24S alloy, heat treated	0.8	0.9	1.6	2.3
57S alloy, heat treated	0.7	0.8	1.4	2.3
annealed	0.4	0.8	1.6	2.4
72-Cu brass, rolled	0.3	0.3	0.6	0.9
annealed	0.3	0.3	0.7	1.0
Leaded brass, rolled	0.7	0.4	0.6	1.9
annealed	0.6	0.5	0.8	1.3
Pure copper, rolled	0.3	0.3	0.8	1.0
annealed	0.3	0.3	0.7	0.9
Iron, annealed	0.4	0.2	0.3	0.5

* Load of 23.6 lb equals 2.6 psi.

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READY TO CHARGE: Container drops off hook directly into pot. Samuel M. Langston Co. photo.

Feed Alloy Pigs in Packaged Form

From shipping to receiving and actual charging into the furnace, there are benefits in packaged alloy pigs.

Easier handling and accounting come at the top of the list.

At first look you'd never think that packaged ingots would be practical. But one supplier has boosted his sales and customer satisfaction by doing just this.

About a year ago, Alloy Metal Products, Inc., Davenport, Ia., decided to package its certified-analysis alloys in corrugated shipping containers. Previously, the company had used steel drums or wooden pallets.

Producers of stainless and other alloys use the packaged ingots for adding nickel and chromium according to metallurgical specifications.

Without unpacking the ingots, the corrugated container can be charged directly into electric or openhearth furnaces.

Aside from convenience in material handling, clear marking of analysis and weight on each package prevents mistaken identity.

Savings in Freight—Because of the great distances many shipments travel, freight expense is important. The switch to corrugated containers lowers freight costs \$15 for a truckload of 40,000 lb, bringing a gross weight savings of 1240 lb.

For the supplier, warehouse space is reduced 50 pct, since the containers come knocked down and palletized. The convenient size cuts material handling costs \$5 per ton.

Cleanliness of product plays an important role in keeping high standards. In supplying alloys of certified analysis, Alloy Metal

Products uses its new packaging to prevent contamination, a problem with loose or bundled scrap, or poorly marked pigs.

Container Disappears—There's no contamination from the container itself. The furnace vaporizes the corrugated container and melts the baling wire to an insignificant iron addition.

Wood cannot be used for the container because it might lead to electrode jamming and breakage.

The pigs weigh about 50 lb apiece. Each corrugated container, measuring about 39 x 29 x 8½ in., carries from 22 to 30 pigs.

Each box has its own corrugated paperboard pallet with skids for easy handling by fork lift truck. Wire-banding the container is at least 10 pct faster than wire-banding the pigs alone on wooden pallets of the usual type.

How to Weld Thick Closures From One Side

Making closure-joint welds that'll stand extreme pressure, heat and corrosion is a tricky business at best.

Usually, the walls of pressure vessels are thick; and welds have to be sound on the inside as well as all the way through.

But the problems really grow when all welding has to be done from outside the vessel.

■ Getting a high quality weld on the inside of a closure joint can be quite a problem when welding must be done from the outside. It becomes even more so when the joint is later subjected to high pressure and corrosive attack.

This was the situation faced by Newport News Shipbuilding & Drydock Co., Newport News, Va., in fabricating the pressure vessel of a homogeneous nuclear test reactor. The pressure vessel consists of two massive hemispheres, 60 in. diam with 4-in. mild steel walls internally clad with 0.4 in. of type 347 stainless steel.

The first problem was to make a root bead with a smooth, uniform and crevice-free inner face that would also be a good foundation for the entire 4.4-in. closure. After this, it was necessary to deposit a 100 pct sound weld through the entire joint—one that'll stand up to highly corrosive heavy water solution under 2000 psi pressure.

Worth the Trouble — A method of obtaining a high quality weld from one side had previously been developed by Electric Boat Div. of General Dynamics. It uses a consumable weld insert made by Arcos Corp., Philadelphia. The system demands much more careful joint

preparation than standard welding practices; but, in cases like this, the consequences of weld failure justify the extra trouble.

The insert is made in wire form with a mushroom-shaped cross section. It's available in cut and straightened lengths, coils and pre-formed rings. For this large radius weld, coils were used.

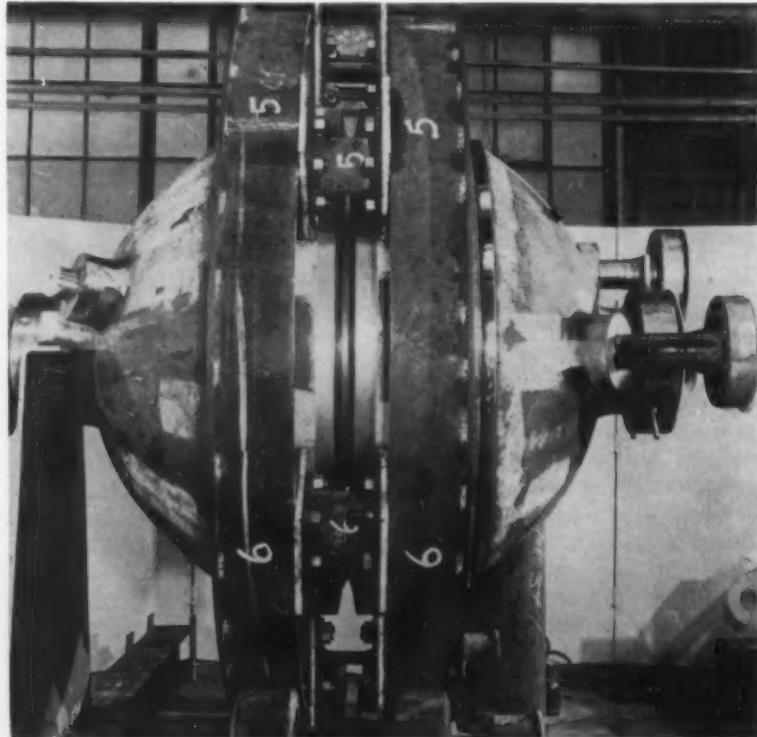
Preparation of the work started by carefully machining both sides of the weld joint. Each side was turned to 3/16 in. radius, leaving an 0.050 edge or land. The surface is machined at a 20-degree angle for a little over an inch. The remainder is tapered 10 degrees. Enough material was removed from the inner tip to leave a 1/16 in.

gap between the two hemispheres for inserting the weld insert.

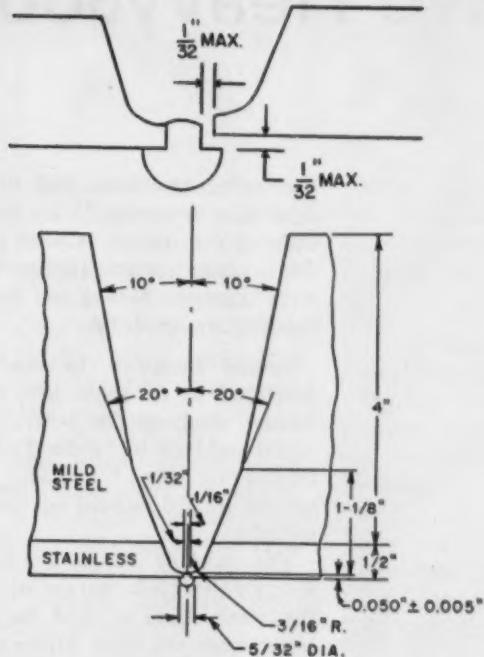
Assembled and Tacked — Next, type 347 weld insert was tack welded to one of the hemispheres; then the vessel halves were brought together in the holding fixture and the second hemisphere was also tacked to the weld insert at 2-in. intervals. This left the stem of the mushroom-shaped insert filling the 1/16-in. gap between the two halves.

The inner surface was protected from oxidation during welding by purging air with an inert gas during the root pass and for two subsequent beads.

The holding fixture was put into the vertical position so that all weld-



EASIER WELDING: After tack welding the vessel is rotated horizontally so all welding can be done in progressive stages from the top.



JOINT DESIGN: Use of the mushroom-shaped insert requires greater care in preparing the joint, but insures a high-quality closure.

ing could be done from the top. Fusing of the weld insert by inert gas shielded tungsten arc from one side only proceeded in 12-in. segments, or about $\frac{1}{8}$ of the circumference. The insert was fused for a complete segment and the second bead was laid over it before the insert was fused in the second section.

After the second bead was laid in the second section, the third bead was run across both the first and second sections. When three beads were completed for two sections, the sphere was rotated 180 degrees and another three beads were run in the same manner on the two opposite sections. The remaining sections were done the same way.

Surface Rises—As it's heated, the insert becomes fluid and forms a molten pool with its surface rising toward the arc. This surface rising indicates that heat has completely penetrated the insert and both halves of the joint. The result-

ing weld contour is uniform and smoothly blended into the parent metal.

Visual, radiographic and ultrasonic inspections insured high quality welds. Twenty-power magnification was used for visual inspection of each segment of the root pass. After deposition of the first three beads a complete radiographic inspection was made of the closure. No radiographic defects of any kind were allowed in the first three beads.

Further radiographic inspections were made at the interface of the 347 stainless steel and the 4-in. shell of mild steel. After a few layers of the main fill electrode, and after completion of the welded joint, ultrasonic inspection was used only on the completed joint before and after stress relief.

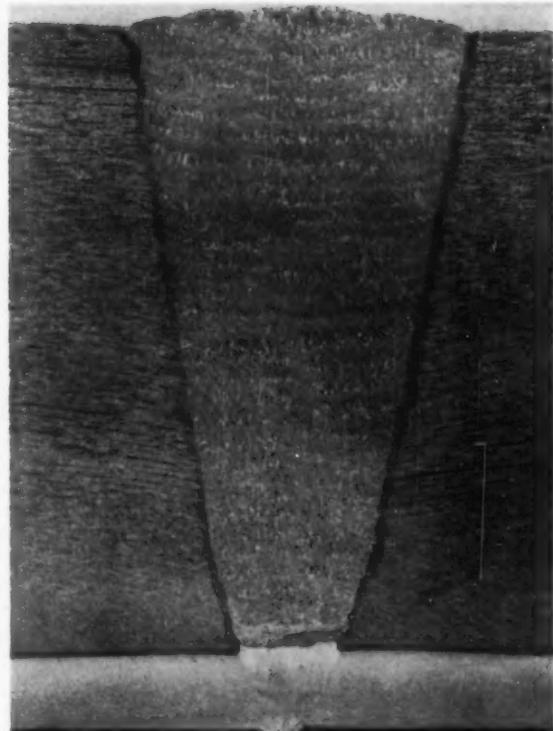
Four Weld Metals—When weld deposit was within $1/16$ in. of the interface, the welding electrode was changed from type 347 to type 308L for 5 passes, and then to

Armco iron. Low amperage and small stringer beads were used to deposit the Armco iron, so 12 passes completed only two layers. The remainder of the joint was filled with E-7016 electrode.

No preheating was used; interpass temperature was held under 200°F for the stainless steel portion and 150°F for the mild steel section. Intermediate stress relief was given after closure was half done. During stress relief, the vessel was filled with inert gas to prevent oxidation.

Local induction heating was applied to a band about 20 in. wide including the weld joint. Heat was applied no faster than 80°F per hour to a top temperature of 975°F, plus or minus 25°F. The top temperature was held for 10 hours; then cooling progressed at 100°F or less per hour.

After the closure was completed, it was given a thorough radiographic inspection.



FINAL RESULT: Finished joint made with Arcos weld insert is sound throughout and provides a smooth surface on the stainless lining.

Let Automation Give Heavy Jobs

By R. H. Eshelman—Engineering Editor

Do you think of automation only in terms of mass production? You're mistaken if you do. The concept can be applied to most any metalworking plant.

Heavy manufacturing is no exception. Look at this automated setup for machining railway car wheels.

■ Going all the way to automation is out of the question in many shops. The initial investment may be prohibitive. And there may be other limitations. But often even a heavy shop can cut costs and boost production by limited adoption of automation techniques.

A leading manufacturer of railway equipment applies this reason-

ing to selected processes when replacing obsolete equipment. A prime example is a new machine to do a tough boring job on car wheels.

Heavy Stock Removal — The cast steel wheels come in four basic sizes and weigh up to 700 lb apiece. Part of the problem was to semi-finish bore these four sizes in one machine. Further, the manufacturer wanted to do the job in one pass. This requires removing up to 11/16 in. of stock on a side. Tolerances call for holding 0.005 in. on diam and 0.002 in. straightness.

A specified production rate of 48 wheels per hour called for flexible automation techniques suited to low volume production. Further,

the boring equipment had to be capable of removing 75 cu. in. of material per minute to meet production requirements. This entailed some ingenious tooling and work-handling arrangements.

Special Design — The machine developed to do these jobs is a vertical single-spindle borer. Designed and built by Snyder Tool & Engineering Co., Detroit, it's tailored for the railroad equipment industry.

The machine has a line-index fixture which holds two car wheels. While one wheel is bored, the operator loads the other fixture with a workpiece. This eliminates loading time from the machine's work cycle.

Automatic Handling — Wheels are held in the fixture by hydraulic chucks that locate on the rough-turned OD. After completing a boring cycle, the fixture indexes a wheel to a side position. This permits unloading the machined wheel and reloading with a fresh part.

In the eventual production setup, automatic handling equipment will load wheels into the chucks at each of the open positions and unload them after machining. This will provide fully automatic operation from initial handling through chucking, machining cycles, and unloading.

Carbide Tooling — Tough 225-Brinell hard workpieces, a high metal removal rate and close tolerances dictated special carbide tooling for the wheel boring job. A special two-step tool was devised to make the cut in the single pass desired. The tool uses mechanically-clamped carbide inserts: two opposed square inserts for rough machining and two opposed round inserts above them to make the semifinishing cut.



FAST WORK: Semi-finish boring of cast steel railway car wheels takes just 70 seconds. Setups for other wheel sizes are made quickly.

a Lift

This tooling is unusually sturdy to handle the extra heavy stock removal at the bottom of the cut. Draft allowance in the wheel hub gives a decreasing diameter. The tool rotates at 225 sfpm. Feed is 0.063 ipr. The boring operation is performed dry, forming short, curled blue chips.

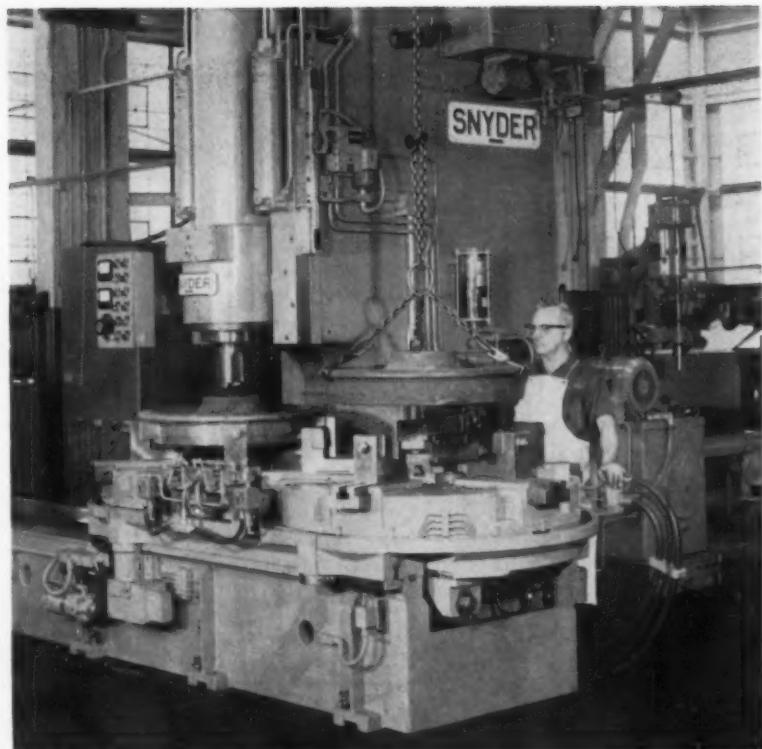
Flexible Setup — Accuracy of the semifinished bore is checked with a dial-type paddle gage. Wheels are then finish bored on another machine so they will press fit the particular axles on which they are to be mounted.

Nominal bore diameters of the four wheel sizes vary from $6\frac{1}{8}$ to $7\frac{3}{8}$ in. However, variations of $\frac{1}{8}$ in. are provided for in the tooling, to meet size ranges in the mating axle and give press fits. Time needed to change the setup to another size is less than two hours. Often it will be as little as half an hour. Normally it requires only repositioning of the chuck jaws and changing the cutter head.

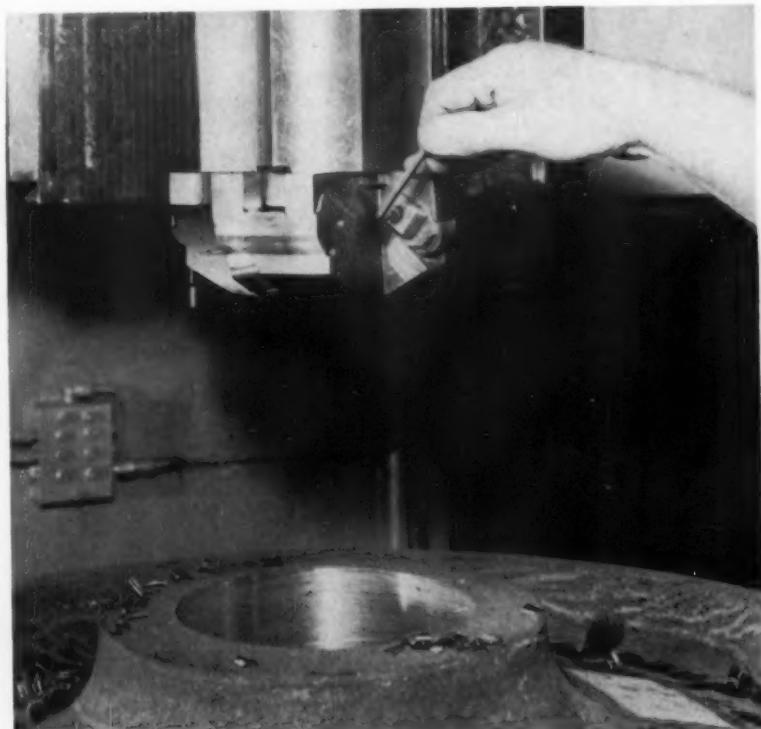
Special Spindle — An unusual feature of the machine is its spindle. To attain specified alignment and straightness tolerances it was made seven feet long. It's supported by two tapered roller bearings at the bottom and one at the top. Hydraulic cylinders move it up and down.

A 75 hp motor drives the spindle through a dc variable speed drive. This gives infinitely variable speed adjustments for boring the various piece-part diameters.

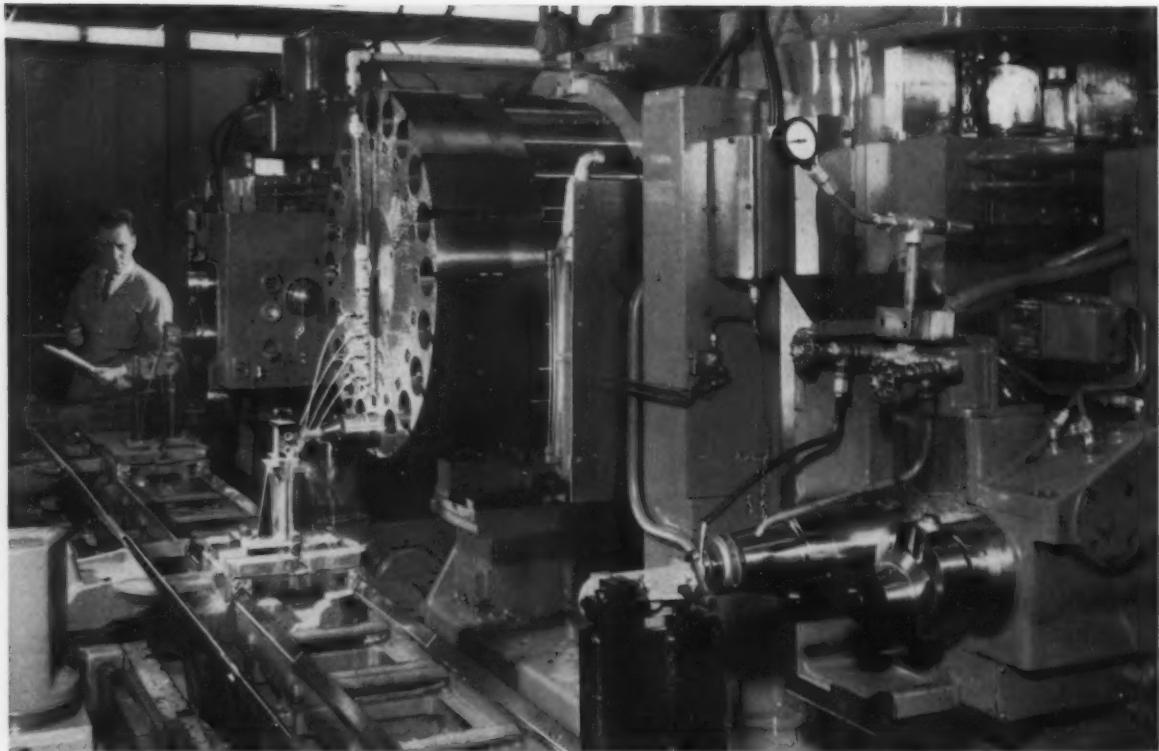
Advantageous Program — There is nothing radically new about this installation. It simply ties together the latest machining and automatic handling techniques to pare production costs. But by so doing, it demonstrates a practical way to upgrade manufacturing methods.



NO TIME LOST: Shuttle fixture lets operator load or unload work-pieces while another one is being bored.



DUAL-PURPOSE TOOL: Mechanically clamped, throwaway carbide inserts are paired on two levels to do rough and semi-finish boring.



FAST TRIPLE PLAY: Team of tape-controlled milling, drilling and boring machines does quick work.

Punched-Tape Units Control New Type Transfer Line

The maxim that small-lot machining doesn't justify the cost of automation no longer holds.

Tape controls on a new type of transfer line mean that short or long runs can be handled with equal ease.

■ An electronically-controlled machine tool line, especially designed to bring automation economies to small and medium lot production, was unveiled last week in Los Angeles.

It's a three-station unit developed jointly by Hughes Aircraft Co.'s

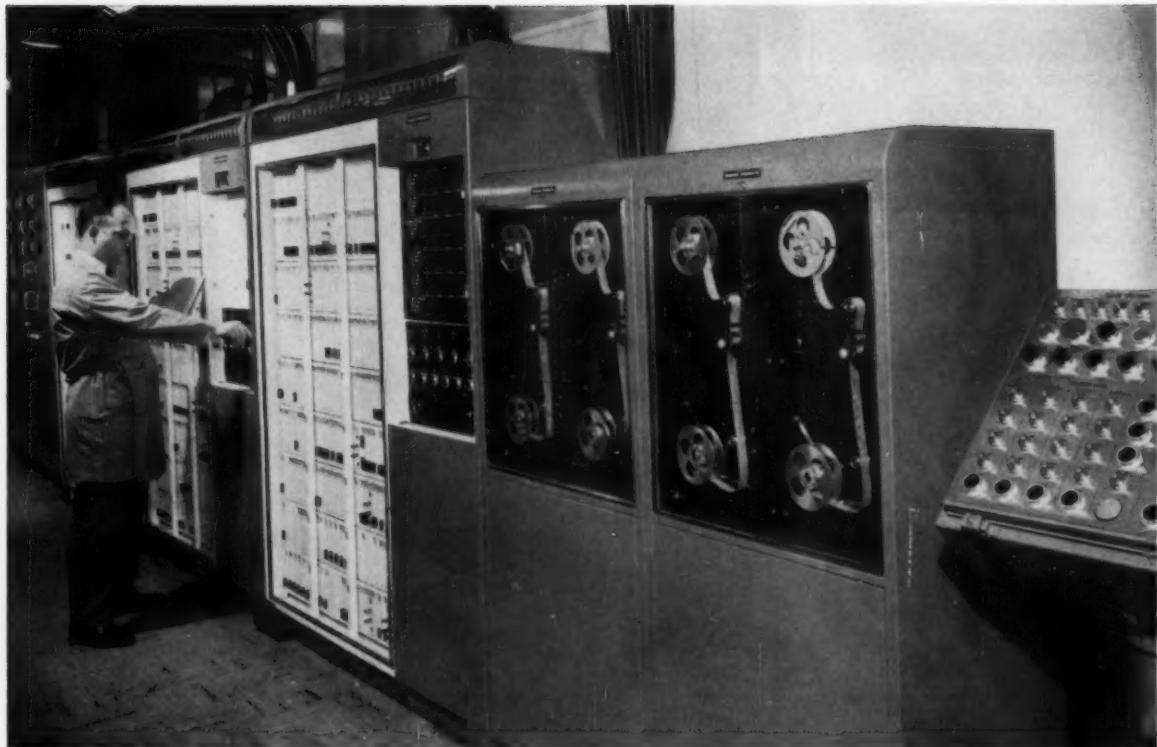
Products Group and the Kearney & Trecker Corp. of Milwaukee. Essentially it consists of separate K & T "building block" units: one each for milling, drilling and boring. Each performs its machining functions on command from separate Hughes Digitape electronic control circuits. A transfer bar links the three machining stations.

The outstanding advantage of the setup is its flexibility for small-lot processing. Because each machining unit has its own tape control, parts can be intermixed on the line with no trouble at all. Within the machine limits, parts of a wide

variety of sizes and shapes can be handled automatically.

Triple-Axis Miller—The milling machine station is arranged so that the head can move in three axes. The 12 in. x 12 in. pallet which holds the workpiece is mounted on a 16-in. diam table which can be tape-commanded to index at any of four positions 90° apart. Feed rates in the low range are variable from 1 to 30 ipm; the high range spans from 5 to 150 ipm.

The milling unit's spindle, powered by a 5 hp motor, has a 50 to 5000 rpm speed range. Feed movement in the longitudinal direction is



MASTER CONTROLS: Master panel (right) and four tape readers relay tape commands to machines.

18 in. There is a 12-in. movement in both the vertical and crossfeed directions.

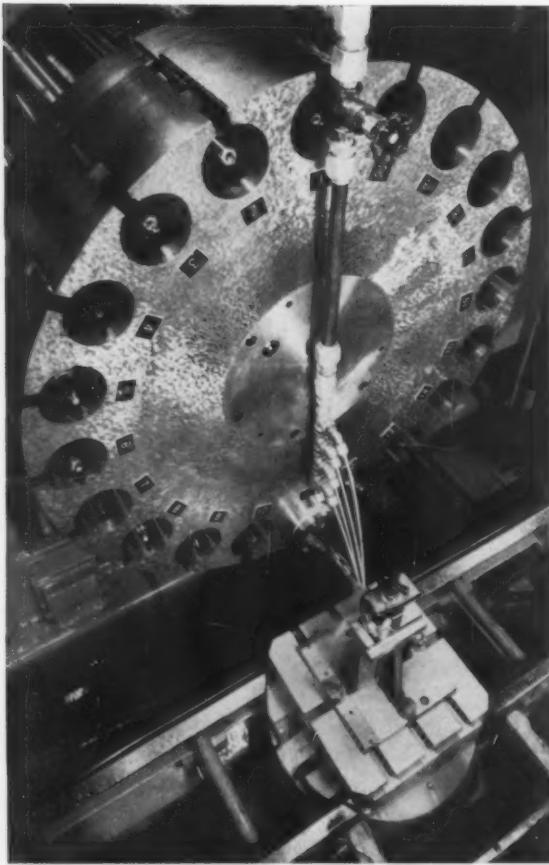
Multiple Drilling Head — The drilling machine has a 20-compartment magazine for storing various sizes of drills and taps. Each compartment has its own drill bushing which is extended when the drill emerges to do its work. This eliminates the need for separate drill boxes or plates for different parts. Moreover, it insures accurate chordal dimensions because the tool can't "walk" or bend.

Each tap in this magazine-type drilling station has its own lead screw to insure accurate thread cutting. If a drill or a tap should break, a safety device comes into play to retract it automatically.

The drilling station also has a 16-in. diam table which can be indexed through a 360° circle. Cross-feed for the drill head is 10 in., with a 12-in. feed movement possible in



PRECISION STARTS HERE: Small pickup head traverses finely ruled bar to position cutting tools on each station within 0.001 in.



WIDE CHOICE: Magazine of the drilling unit has 20 compartments to hold a variety of tools.



ONE TAPE FOR EACH: Transfer setup will tape-machine any part the building block units can reach.

both the longitudinal and vertical directions. Drill feed is 4 in., while the tap feeds a distance of 2 in. Feed rates from 1 to 150 ipm are distributed over a high and a low range. Spindle speeds range from 110 to 9000 rpm.

Dual-Spindle Borer—The boring machine unit has a boring bar which sets automatically to proper dimension in response to punched tape signals. It also has two spindles to cover a wide range of bored-hole sizes. However, a milling cutter can be inserted in one of the spindles to increase the unit's versatility.

As with the milling and drilling machines, the boring unit has a 360° indexing table. Longitudinal feed movement is 12 in., plus the 6 in. space between spindle centers. Movement is also 12 in. in both the

vertical and crossfeed directions. Feed rates are the same as those provided in the drilling unit. Spindle speeds are variable from 50 to 500 rpm.

Although the present transfer set-up is considered a prototype, it is doing production work on a wide variety of parts for Hughes armament control systems used in military aircraft. Production transfer units and their matching tape controls will be available for delivery this year, however.

Many Arrangements Possible—Similar transfer lines for almost any type of diversified machine shop work can be arranged in a variety of ways. Because of the modular construction of individual milling, drilling and boring units, any combination can be set up.

Officials of both firms emphasize that costly jigs are not needed. Parts are held in simple fixtures while the tape-actuated controls dictate all movements involved in workpiece rotation, machine-head positioning, and cutter feed and speed. Even manual loading and unloading of workpieces can be done automatically, if desired.

From Print to Part—Converting a blueprint design into a finish-machined product calls for a few simple steps. Part dimensions and operation sequences are listed on a planning sheet. A typist then transcribes this data into punched tape form, using a special typewriter. The reels of punched tape pass through a "reading" unit in the control system and are translated into machine commands.

Blast Unit Cuts Cleaning Costs

Getting the job done faster is only one requirement in reducing railroad car cleaning costs.

A flexible pace is also necessary to keep in step with other reconditioning stages.

■ A new automatic airless blasting unit cleans railroad cars at a reduction of 85 pct in cleaning manhours. It now takes 2 manhours to clean typical 42-ft hopper cars, where it used to take 13½.

Like high-speed production lines, three reconditioning runways at the Samuel Rea Shops, Pennsylvania Railroad Co., Hollidaysburg, Pa., take boxcars, gondolas and flatcars through repairing, cleaning, and painting steps. The speed of the initial steps sets the pace for all machines and operations in the total process.

Expandable Output — Considering future needs, the manufacturer of the cleaner, Pangborn, Corp., Hagerstown, Md., engineered the unit so it could handle higher capacity at a later date. At present the cleaner handles two cars per hour.

Actual cleaning time per car is 22 minutes: 11 minutes of Rotoblasting plus 11 minutes of airblast touch up at ends of cars where the Rotoblast stream does not directly contact the metal. Newer cars require shorter blasting time than old equipment.

Of four operators, two run the automatic and manual blasting equipment, while two handle the air-hose blow-off of abrasive to minimize carryout.

Uniform Coverage — Eight 140-2RG Rotoblast wheels are mounted in the blasting room, which measures 40 x 15 ft with 18-ft height. Three are located on each side to provide uniform abrasive coverage on car sides. Two are in the ceiling

to blast downward over the car width.

High quality Mallansteel, a mixture of shot and grit, is hurled against the work by centrifugal force as the cars pass in front of the abrasive throwing wheels. Operating with 10-hp motors at 3400 rpm, each wheel throws about 1500 lb per hour.

The wheels start as soon as the car enters the blast zone and are shut off manually when the car is past the wheels. Individual controls permit the upper side and ceiling units to be shut off when blasting open gondola cars.

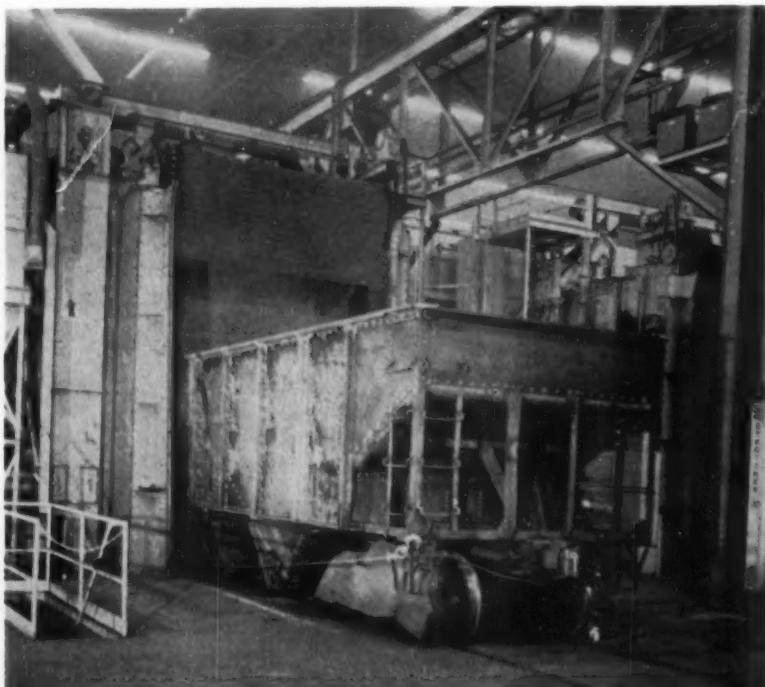
Present cleaning speed is accomplished with four of the eight wheels. Hopper cars require only two wheels per side; the upper side wheels and overhead wheels are used only with larger boxcars.

Finish with Spot Blast—Two

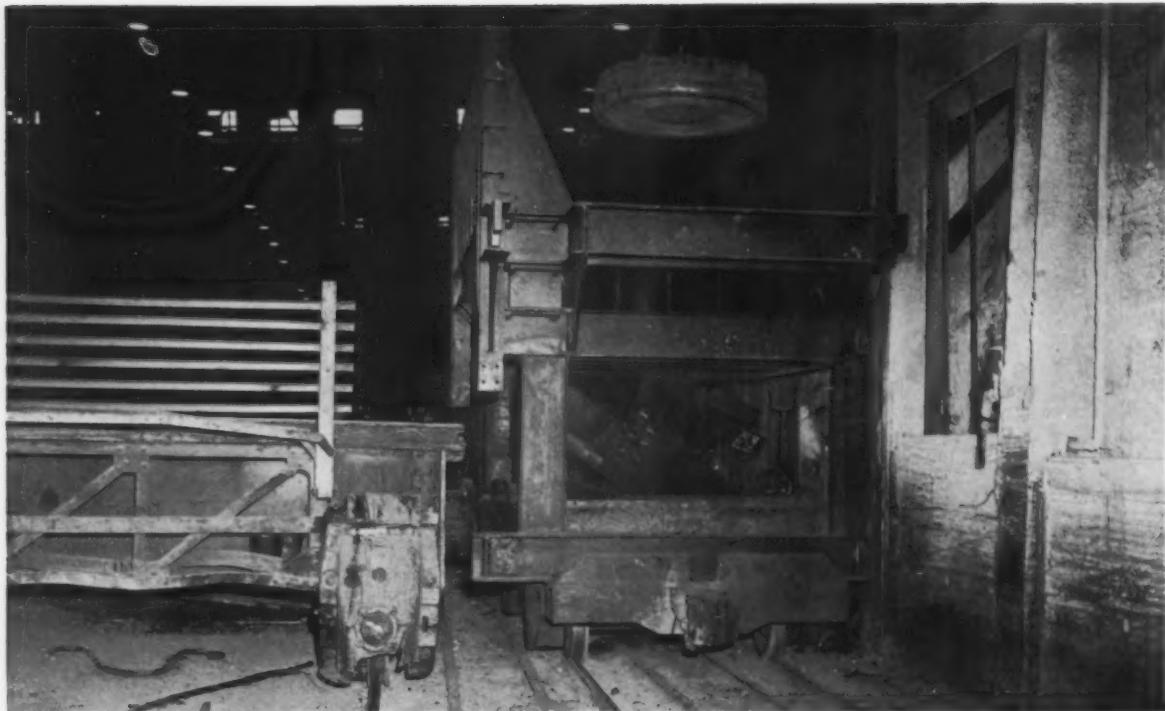
automatic Pangborn AQ-1 continuous airblast units spot blast for touch-up and cleaning car ends. Four power driven elevators, two on each side of the room, are used by the airblast and blow-off operators to maneuver up and down.

Spent abrasive and blasting debris drop into steel hoppers which lead to oscillating conveyors, then into two spiral-screw cross conveyors. A scalping wheel removes the coarse material. Two belt bucket elevators hoist the abrasive to a pair of Pangborn separators that clean the abrasive for reuse.

Power-driven roll-up steel doors at both ends of the room confine flying abrasive. Heavy-duty rubber curtains at the exit and entrance vestibules also aid in reducing abrasive throwout. Two Pangborn type "CH" cloth screen dust collectors exhaust the three blast rooms at 82,200 cfm.



ENTERING FAST CYCLE: Variable-speed winch pulls hopper car into blast room. Steel mesh doors roll down after car enters.



MORE EFFICIENT: Scrap is loaded into charging boxes directly in front of openhearth door. Hopper

makes it possible to haul scrap to furnace in rail car, greatly reduce congestion.

Fast Scrap-Charging Boosts Openhearth Output

By G. J. McManus — Pittsburgh
Regional Editor

When scrap-charging is speeded up, operating costs at the steel furnace are cut two ways.

Not only does scrap-charging become more efficient, but heating time and waste motion are appreciably reduced.

■ A new scrap-charging method is drawing attention of steelmakers to the Butler, Pa., works of Armco Steel Corp. This new technique provides important savings by cutting operating costs two ways. Because it reduces charging time to

the openhearth by one hour, furnace heating time is similarly shortened.

In the Butler operation, scrap is hauled to openhearth furnaces in a modified gondola car. A magnetic crane lifts the scrap from the car and dumps it into a hopper just outside the door of an openhearth. Scrap feeds through the hopper into a charging box. It is shoved into the furnace by a conventional charging machine.

This method eliminates the small buggies that ordinarily carry scrap from stock yards to steel furnaces. One 34-ft gondola car at Butler takes the place of eight 15-ft buggies. As a result, congestion is

relieved, waste motion is reduced, and charging is faster.

Helps Production—Armco feels the new method will help increase steel output by about 10 pct. Along with a program for combustion oxygen, it may bring an increase of 3 tons per hour per furnace. Charging time is expected to drop by 30 pct.

New techniques for speeding furnace reactions are showing up furnace charging as a serious bottleneck. Few shops can take full advantage of the gains offered by basic roofs, oxygen decarburization, and oxygen combustion. Auxiliary equipment just isn't fast

enough to keep up with furnaces on a shop-wide basis.

That was exactly the situation facing Armco at Butler, where a new hot strip mill pointed to an eventual need for more steel. Armco operates a cold metal shop in Butler. There are six 145-ton openhearts and one electric furnace. The openhearts take about 70 pct scrap and 30 pct pig iron.

Less Heat Time—Tests on one openhearth showed that oxygen feed increased the firing rate by 30 pct and brought a comparable reduction in heat time. But when the tests were applied to more than one furnace, output gains fell off sharply. With charging time running 6 hours or better per heat, the time saved in scrap meltdown was lost while a furnace waited its turn for recharging.

To correct the situation, Armco began working with a hopper system built by Wellman Engineering Corporation and conceived in its basic form by Albert Calderon.

The development process still continues. Armco has not been able to get enough normal production experience to establish performance accurately and fully. But the company is sold on the system to the extent that it is ordering a second full unit.

How It Works—In its present form the charging assembly consists of a standard railroad car cut down to 34 ft by 8 ft; a hopper that measures 15 ft long, 14 ft high, and 8 ft wide; and charging boxes that hold 30 cu ft.

Scrap is loaded into the car from the present stockyard that is in the openhearth building and runs parallel to the six furnaces. It takes about 15 pct less time to load the car than to load the same amount of scrap directly into charging boxes on buggies.

The time saving might be even greater at some yards. At Butler, scrap comes from a lower level and must be lifted over the car sides. Stock tending is simplified by the car method. Traffic at the yard is reduced.

Saves Space—The filled car is spotted alongside the hopper in front of an openhearth. Both ride on the same track. Standing together, the hopper and car extend 45 ft. This means the end door of one furnace can be charged without blocking the nearest door on the adjacent furnace. In the same situation, a normal train of buggies would block the entire adjacent furnace.

At the Butler plant, an overhead crane is available for lifting scrap from the car to the hopper. In a hot metal shop, the system is designed to operate with its own crane.

Hopper chutes are curved in such a way that the scrap tends to align itself and to fall into a charging box below without excessive spillage. Three 30 cu ft boxes sit below the hopper. The one in the center takes most of the scrap and is charged into the furnace. The outer boxes are shifted to the charging position only when they fill up or the center box overheats.

More Capacity—Basically, the system's advantages center on the

fact that it moves scrap in large, compact batches. The Armco car holds eight times as much scrap as a buggy. It is only twice as long as a single buggy. The volume movement is made possible by the hopper, which makes it practical to fill charging boxes at the furnaces.

A number of other approaches are being applied to the problem of increasing scrap charging speed. The most direct is simply to increase the sizes of charging boxes, furnace doors, and charging machines. Boxes of 45 to 50 cu ft are common today; one mill is trying a 100 cu ft box for light materials.

Considerations in this approach are the need for cooling doors, the need for providing roof support, and the expense of new charging machines.

Use of king-sized bundles is one answer for the larger furnaces. Machines like the Harris TG 3000 will turn out bundles 5000 lb and larger. However, there are just so many yards that bale this size bundle and just so many mills that can handle them.



NEW SYSTEM: Three charging boxes sit below feed chute in charging system at Armco Steel Corp.

New Plastic Stays Strong at High Temperature

Plastics are doing some remarkable things where elevated temperatures are concerned.

This one—a phenolic-asbestos combination that retains its properties at several thousand degrees — is already crashing through the heat barrier on a number of fronts.

■ A family of plastic laminates and molded parts that withstand temperatures up to 3500°F has been developed by Continental-Diamond Fibre Corp., Newark, Del.

In one industrial application the new heat- and flame-resistant reinforced plastics are in continuous use at 500°F and intermittent service at 900°. Tests indicate the laminates and molded parts will re-

main useful at 2500 to 3500°F for limited periods.

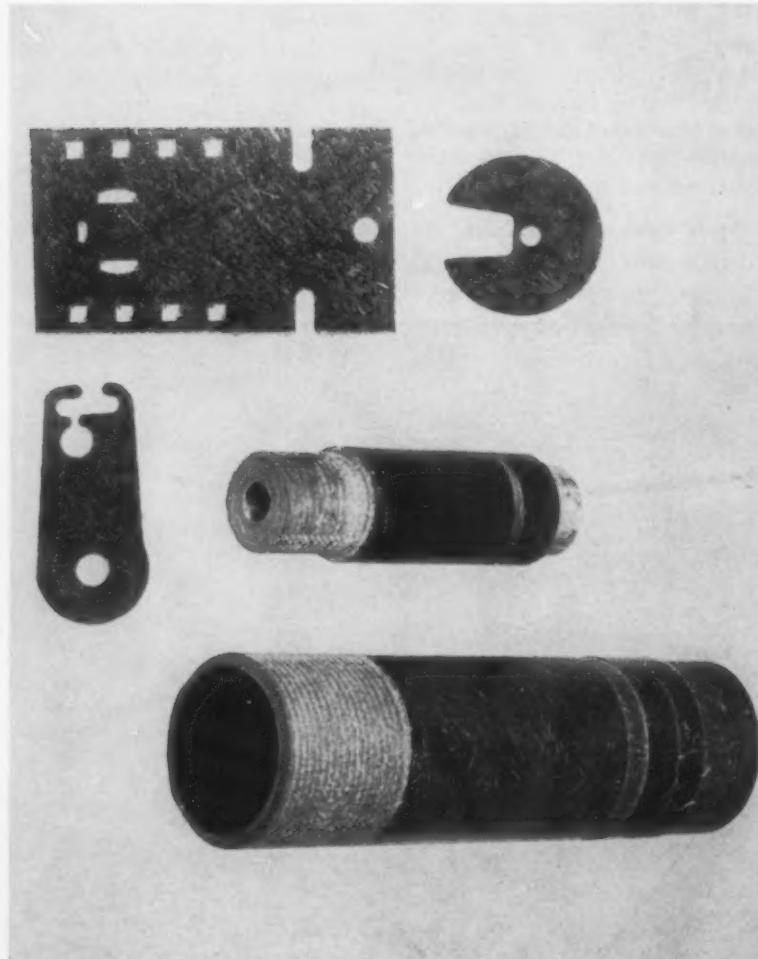
They're also suitable for uses based on the new concept of "ablation" or using-up of materials in certain rocket and missile work, where temperatures of 4000 to 5000°F are encountered.

Basic raw materials used in the laminate form are a special felted asbestos impregnated with a heat-resistant phenolic resin or varnish. Molded tubes, rods, and parts use the same kind of phenolic resin combined with asbestos suitable for molding operations.

Easy to Fabricate — Both types can be fabricated or machined by conventional methods, including drilling, milling, tapping, sawing, countersinking and counterboring, threading on automatic screw machines, and many other machine-tool operations. The laminates have been cold-punched up to 1/16 in. by standard punching techniques.

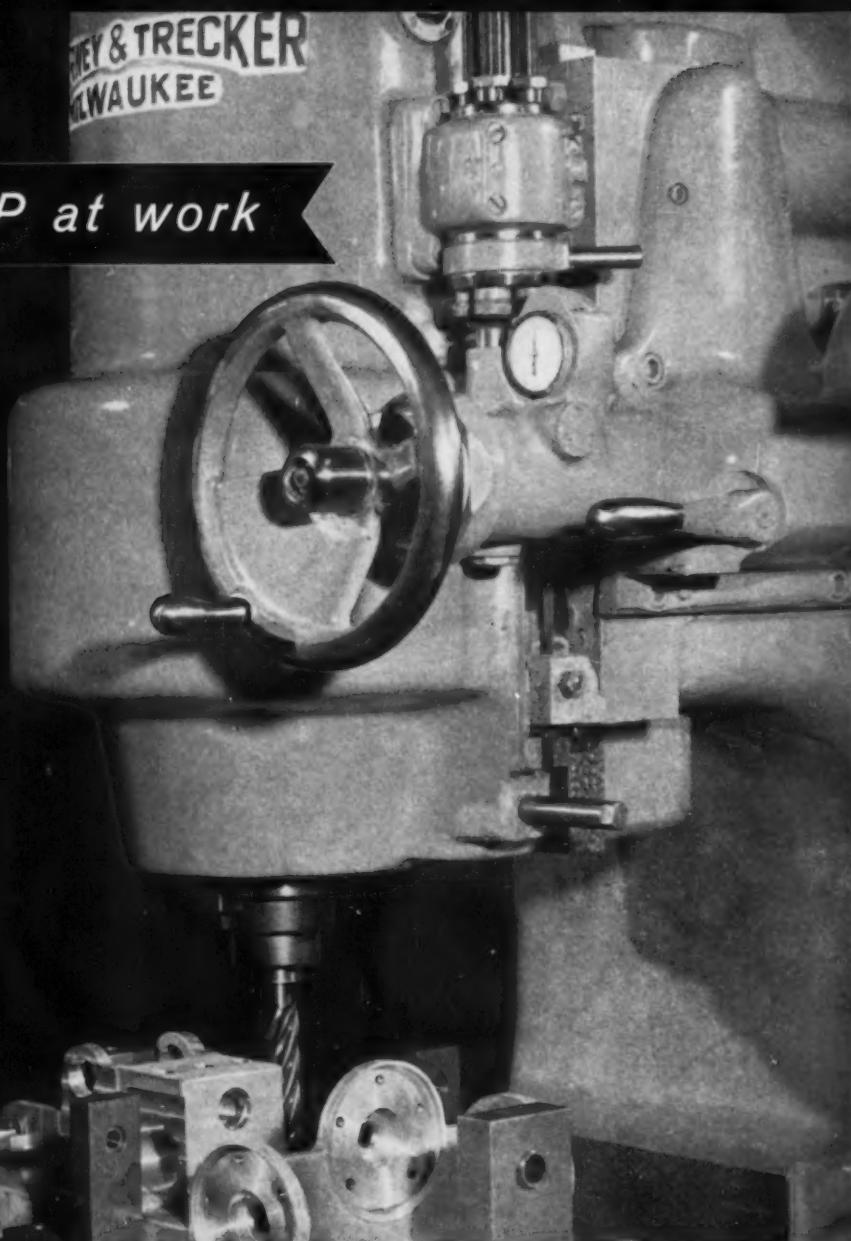
The new CDF asbestos-phenolic products have average electrical insulating properties when compared to electrical grades of regular high-pressure laminates; but preliminary tests on 0.045-in. thicknesses have shown short-time dielectric strength of 160 vpm. Other tests indicate arc resistance of about 190 sec. (ASTM D-495.) Other electrical properties are essentially the same as NEMA Grade A.

In addition to this combination of properties, the new heat-resistant phenolics have high stiffness (high modulus of elasticity); high mechanical strength at low and high temperatures; chemical and water resistance; good insulation and thermal properties; a smooth, nonabrasive surface; high impact strength; low porosity; and good dimensional stability.



FOR HIGH HEAT: The new Dilecto heat-resistant laminates and Celoron molded parts are easily processed by standard metalworking methods.

LEADERSHIP at work



Lights! Action! Camera . . . In the making—Playing a leading role in the manufacture of motion picture cameras at Mitchell Camera Co., Glendale, Calif., is this Kearney & Trecker—Milwaukee Model CH No. 4 vertical milling machine. Here the operator mills the aluminum base for tilt-pan head of the camera. Mitchell reports that this machine is used on practically all major camera parts. Truly a star in maintaining close accuracy and reducing production costs.

KEARNEY & TRECKER
MILWAUKEE

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Kearney & Trecker's man on the job . . .

Dave Schnabel of Moore Machinery Co., Los Angeles, analyzed Mitchell's production and recommended the CH vertical. For expert milling counsel, call the Kearney & Trecker man near you. And remember to ask him, or write direct, for free, comprehensive catalog.

Kearney & Trecker staff photo by Ron Johnson





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a 4-page brochure. (C. A. Norgren Co.)

For free copy circle No. 4 on postcard, p. 119

Induction Motor

Large induction motors are featured in a 16-page bulletin. It details motors rated from 150 to 1250 hp, in open drip-proof, splash-proof, enclosed and explosion-proof enclosures. (Louis Allis Co.)

For free copy circle No. 5 on postcard, p. 119

Blanking Press

A 4-page bulletin describes a 400-ton capacity heavy material blanking press. Construction features which give the massive press its rigidity and tremendous power for blanking heavy material up to $\frac{1}{2}$ -in. thick (or more) are shown. (Minster Machine Co.)

For free copy circle No. 1 on postcard, p. 119

Light Structural

Design properties of joist sections are included in an 8-page booklet on lightweight structural. In addition to information on 10- and 12-in. joist sections, it contains data on junior beams, junior channels and lightweight beams. (Jones & Laughlin Steel Corp.)

For free copy circle No. 2 on postcard, p. 119

Fasteners

Nonferrous and stainless steel bolts, nuts, screws, rivets and washers are listed in a unique pricing catalog. It contains complete listings of all sizes of every standard item in one firm's line plus many extra stock items. (H. M. Harper Co.)

For free copy circle No. 3 on postcard, p. 119

Compressed Air

How you can benefit by proper compressed air processing is told in

Maintenance

Preventive maintenance and good operating techniques pay off in top machine performance. With this in mind, a tractor manufacturer has prepared a 30-page booklet which explains how one owner improved machine performance and longevity through good maintenance practices. Cartoons simplify explanations. (Caterpillar Tractor Co.)

For free copy circle No. 6 on postcard, p. 119

V-belt Selection

A 16-page booklet deals with testing, inspection and quality control of V-belt production. It explains how raw materials and finished belts are tested and inspected. One section explains quality control procedures; another, experimental production. (Goodyear Tire & Rubber Co.)

For free copy circle No. 7 on postcard, p. 119

Materials Handler

A 4-page bulletin gives details of a "magic loading" materials handler. The brochure contains on-the-job illustrations showing how

the unit helps users unload a complete boxcar in one hour or less. (John Morrell Mfg. Co.)

For free copy circle No. 8 on postcard, p. 119

Hardfacing

A 5-page data sheet describes procedures for hard-facing farm implements. (Wall Colmonoy Corp.)

For free copy circle No. 9 on postcard, p. 119

Brazing

Recent news about brazing in various applications appears in a 4-page folder. Featured is an item about a manufacturer who saved time, money and effort by silver brazing metal belt buckle components. The bulletin also contains several other case histories. (Handy & Harman.)

For free copy circle No. 10 on postcard, p. 119

Plant Location

An economic portrait of Arizona is given in a 30-page booklet. It provides a quick, yet comprehensive view of the state's ability to sustain progressive industry. And it tells how you can profit by locating your new plants there. (Arizona Development Board.)

For free copy circle No. 11 on postcard, p. 119

Countersink

Tool products for deburring, chamfering and countersinking are covered in a bulletin. (Nobur Mfg. Co.)

For free copy circle No. 12 on postcard, p. 119

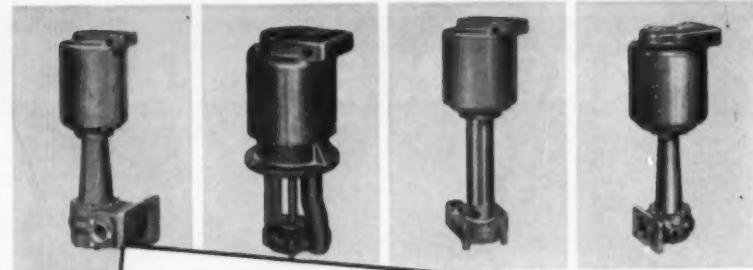
Barrel Finisher

A data sheet introduces a new multiple-purpose barrel finishing unit. It describes a highly versatile unit which can cut production costs 80 pct or more. (Speed-D-Burr Corp.)

For free copy circle No. 13 on postcard, p. 119

Packaging

Fast, easy strapping is promised in a folder for users of pressure sensitive tape materials. Using a special tape binding unit, you can



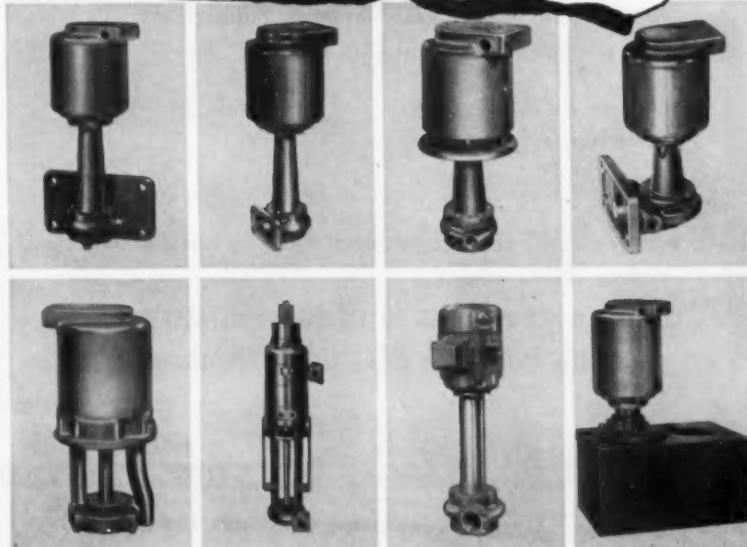
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FREE LITERATURE



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quickly, easily tie-up, strap or bundle practically any item. Tape described is strong, filament-reinforced. (A. J. Gerrard & Co.)

For free copy circle No. 14 on postcard, p. 119

Bench Punch

A lever type punch for bench use is detailed in a publication. It also describes a bench punch equipped with a notching attachment. (W. A. Whitney Mfg. Co.)

For free copy circle No. 15 on postcard, p. 119

Stepping Motors

A 4-page bulletin notes one company's line of rotary solenoids, selector switches, hermetically sealed selectors, and stepping motors. (G. H. Leland, Inc.)

For free copy circle No. 16 on postcard, p. 119

Lift Trucks

A "cutaway" brochure describes a line of rider-walkie trucks. Using die-cut pages, it pictorially disassembles the lift trucks to point out all operating features. (Yale & Towne Mfg. Co.)

For free copy circle No. 17 on postcard, p. 119

Piston Rings

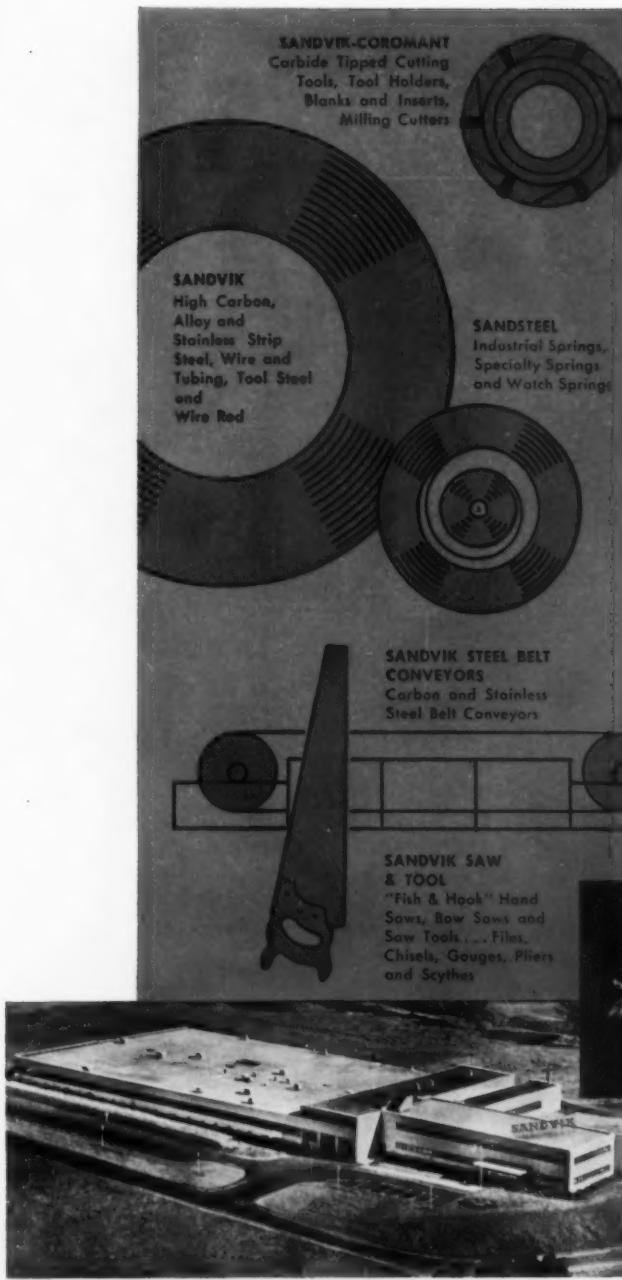
An 8-page brochure is designed to help engineers obtain high engine performance by careful attention to replacement of piston rings. Procedures for checking pistons and cylinders are included. So are suggestions on installing new rings. (Metal Products Div., Koppers Co., Inc.)

For free copy circle No. 18 on postcard, p. 119

Ductile Iron

Ductile iron is the subject of an 18-page digest-type publication. It describes a metal "as strong as carbon steel" with tensile strength up to 200,000 psi. The metal can be twisted and bent without cracking. It has as much as 30 pct elongation. (International Nickel Co., Inc.)

For free copy circle No. 19 on postcard, p. 119



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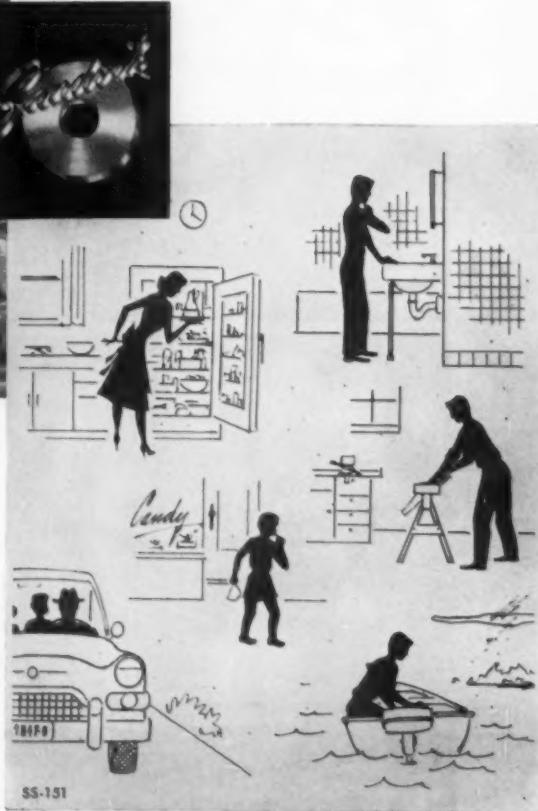
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Serve Millions Of Americans

In razor blades and refrigerators, in clocks and cars, in hand saws and industrial tools, in chemicals and candy...almost anywhere you look, Americans use Sandvik products.

From coast to coast, Sandvik's consistent product quality and specialized service benefit both industry and the individual consumer. That's the reason why Sandvik has been growing with America since 1878.



Precision Rings

with little or no machining



Today you can purchase precision flash butt-welded rings that require little or no machining to meet your specifications. Made from bar stock of finished gauge, they can be produced to meet the same tolerances as conventionally machined rings. Cost of production and materials of some rings has been reduced as much as 60%. Sizes and materials at present are limited to those bar stocks which can be furnished to precise finished dimensions. However, persistent efforts of American Welding engineers and the producers of finished bars give promise of a widening range of sizes and metals that can be manufactured by precision forming and welding.

This is another example of why you should call American Welding first — if the problem is circular and of metal.

New Products Catalog

Write today for 20-page catalog of circular products which American Welding can form, weld and machine for you.



AMERICAN WELDING

THE AMERICAN WELDING & MANUFACTURING CO.
120 DIETZ ROAD • WARREN, OHIO

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Tape-run Borer

An 8-page brochure introduces tape-controlled turret drilling, tapping, and boring machines. It tells how you can cut production costs by using this simple numerical-controlled positioning table setup. (Burg Tool Mfg. Co.)

For free copy circle No. 20 on postcard

Press Modernizing

Modernization and conversion assemblies for older straight side and gap frame double crank presses are described in a 16-page bulletin. It lists 42 kits designed to bring obsolete presses up to date. (E. W. Bliss Co.)

For free copy circle No. 21 on postcard

Arc Welding

Newly revised a 24-page catalog gives information on a company's inert-gas-shielded tungsten arc welding process. It's used for rapid joining of light gages of most engineering metals and alloys. (Air Reduction Sales Co.)

For free copy circle No. 22 on postcard

Pump Motors

Totally protected, pump motors are discussed in a 4-page bulletin. These motors range from $\frac{1}{6}$ to 1000 hp. (Reliance Electric and Engineering Co.)

For free copy circle No. 23 on postcard

Welded Assemblies

Rings, bands and welded assemblies are subjects in a 20-page products catalog. Sections of the catalog are devoted to titanium

and aluminum rings, carbon steel rings, stainless steel and special alloy rings, precision rings, and special fabrications. (American Welding & Mfg. Co.)

For free copy circle No. 24 on postcard

Production Ovens

Truck - loaded type production ovens are described in a data sheet. These standard ovens serve a variety of purposes. (Despatch Oven Co.)

For free copy circle No. 25 on postcard

Liquid Rheostats

Liquid rheostats are dealt with in two new bulletins. Liquid rheostats are applied as slip-regulators in the steel industry to shield the power system from short, sharp-peak loads. They are also used to control large motors, equipped with flywheels, that drive generators for mill motors, or for driving rolling stands directly. (General Electric Co.)

For free copy circle No. 26 on postcard

Metal Powder Press

Advanced features of a new 50-ton compacting press for powdered metals are described in a 4-page bulletin. (Hamilton Div., Baldwin-Lima-Hamilton Corp.)

For free copy circle No. 27 on postcard

Densitometer

Featured in a 4-page brochure is a film comparator densitometer. This spectrochemical unit measures the light transmission of a spectrum line and projects the scale readings on an easily read screen. Such a setup is designed to speed sample analysis. (Applied Research Laboratories).

For free copy circle No. 28 on postcard

Miniature Couplings

Tiny power couplings, smaller than a car ignition key in length, and with a circumference less than that of a half-dollar are described in a bulletin. They are non-magnetic and light-weight, with low elastic yield under torque. Except

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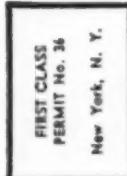
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FREE LITERATURE

for stainless steel set-screws, they are constructed entirely of nonferrous materials such as anodized aluminum alloy, beryllium copper and brass. (Thomas Flexible Coupling Co.)

For free copy circle No. 29 on postcard

Steel Tubing

Technical working data on mechanical steel tubing are contained in a 12-page catalogue. The bulk of the book is devoted to tables showing size range, cutting and size tolerance of round tubing; size ranges, radii of corners and tolerances of square and rectangular tubing. (Brainard Steel Tubing Div., Sharon Steel Corp.)

For free copy circle No. 30 on postcard

Hazard Handlers

A 12-page folder illustrates some twenty-six different technical enclosures for the safe handling of all types of contaminants. The equipment is made from stainless steel for easy decontamination, cleanliness, and corrosion resistance. (S. Blickman, Inc.)

For free copy circle No. 31 on postcard

Wheels

Caster wheels for industrial equipment are described in a bulletin. It discusses properties of the wheel material which makes them non-sparking, non-inflammable and resistant to abrasion and moisture. (Rapids-Standards Co., Inc.)

For free copy circle No. 32 on postcard

Lathe

"Different . . . productive . . . versatile." That's how a lathe manufacturer describes its machines in a new 32-page bulletin. Suitable for both manufacturing operations and toolroom use, the lathes, 12 models in all, incorporate an exclusive pre-selective speed shaft headstock. This unit allows pre-setting of required operating speeds. And

it provides automatic spindle speed calculation, a wide 36 speed range (17 to 1750 rpm) and finger tip hydraulic shifting. (For free copy write on company letterhead to Monarch Machine Tool Co., Sidney, Ohio.)

Fuels, Lubricants

Nutating disc meters covered in a bulletin measure lubricating oils, kerosene, diesel fuel or gasoline. Two models, one open and one enclosed, available in $\frac{3}{4}$ and 1-in. sizes and weighing only 7 lb are shown. These units are approved by Underwriters Laboratories. (Rockwell Mfg. Co.)

For free copy circle No. 33 on postcard

Oven Suits

Described in a bulletin are new air-fed oven suits of aluminized asbestos fabric. These offer "unmatched protection against radiant heat," the bulletin says. It tells why. (Mine Safety Appliances Co.)

For free copy circle No. 34 on postcard

Precision Balls

A new chart shows the relative electric and magnetic properties of the most widely used precision ball materials. (Hartford Steel Ball Co., Inc.)

For free copy circle No. 35 on postcard

Cut-Off Machines

Abrasive cut-off machines are described in a bulletin. The equipment covered includes small standard cut-offs of 5 hp, up to big, tough universals of 20 hp which cut at practically any angle from almost any shape casting. (Tabor Mfg. Co.)

For free copy circle No. 36 on postcard

Gear Generators

Gear generators are featured in a 32-page brochure. These machines generate gears of all types which operate on parallel axes. (Farrel-Birmingham Co., Inc.)

For free copy circle No. 37 on postcard

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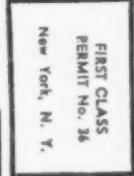
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What are your Rollpin® requirements...

Corrosion-resistant steel, beryllium copper, or carbon steel? An "available" fastener with better than 90% of the catalogued size and length combinations obtainable from stock? A fastener with consistent dimensional quality control and fully dependable strength and vibration performance? A fastener that costs less than most of the pin type fasteners it replaces . . . and cuts assembly costs too?

Slotted, chamfered, cylindrical Rollpin spring-pins meet these requirements and many others. Available Rollpin inventory stands at tens of millions of pieces. Rollpin

performance is consistently high because uniform shear strength, dimensions and hardness are guaranteed by high ESNA quality control standards. Investigate installed Rollpin costs as compared to grooved-type pins, taper pins, precision dowels and many types of rivets.

Standard Rollpins are made from carbon steel and Type 420 corrosion-resistant steel in stock sizes from .062" diameter to .500". Cadmium, zinc or phosphate finishes may be specified. They're also available in beryllium copper for applications requiring exceptional resistance to corrosion, and anti-magnetic and non-sparking properties—in diameters from .062" to .250".

Why not simplify and speed up your orders by sending for data on all the Rollpin sizes and materials today? Elastic Stop Nut Corporation of America, Dept. R46-377, 2330 Vauxhall Road, Union, New Jersey.

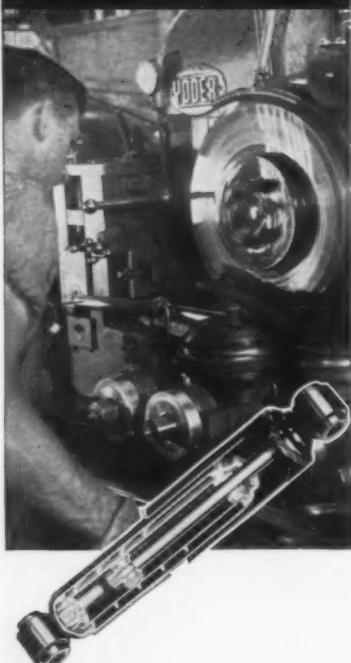


ELASTIC STOP NUT



CORPORATION OF AMERICA

**Monroe Shock Absorbers
rely on
Precision Performance of
YODER TUBE MILLS**



After 15 years of continuous operation the Yoder Type-M Electric-Resistance Weld Tube Mill shown here, is still producing precision tubing for the Monroe Auto Equipment Co., Monroe, Michigan. Yoder produced tubing is the basic component of the famous "Monro-Matic" shock absorber. Measuring $2\frac{3}{16}$ " outside diameter (plus several other sizes) the tubing is made from 22 gauge strip in one continuous operation . . . it is automatically cold-roll formed, welded and cut to pre-determined lengths.

This typical installation of a Yoder tube mill exemplifies the accuracy, dependability and production economies of Yoder-made tubing. If your business requires pipe or tubing, ferrous or non-ferrous, in sizes from $\frac{1}{4}$ " to 26" diameters, there is a Yoder mill designed to produce it economically, efficiently and accurately.

THE YODER COMPANY
5510 Walworth Ave. • Cleveland 2, Ohio

Check into the many cost-saving advantages of operating a Yoder pipe or tube mill . . . write for the fully-illustrated 88-page Yoder Tube Mill Book . . . it is yours for the asking.



**PIPE AND
TUBE MILLS**
(ferrous or non-ferrous)

TECHNICAL BRIEFS

Barrel Finish Unit Holds Tolerances

When properly used, barrel finishing delivers two very attractive results.

First, it can boost output, resulting in direct savings.

Second, many users find that they get a better end-product.

Many companies have learned through hard experience it pays to find out everything possible about any piece of new equipment purchased for a special job. And if in the process of learning, it is found that proper use of the equipment results in big cost reductions, better work, and sharply stepped-up production, the dividends are handsome indeed.

That about sums up the recent experience of AiResearch Mfg. Div. of The Garrett Corp. And it explains the new look in firm's metal finishing department of its Phoenix, Ariz., plant.

Two-Fold Challenge — Precision finishing of magnesium, aluminum, bronze and steel parts is a highly important operation for the company. Much of its reputation is pinned to the supplying of finished, close-tolerance materials and parts to the aircraft industry.

The problem was two-fold: (1) turning out more finished pieces of work per week and (2) maintaining a higher degree of tolerance and uniformity. Since no solution was to be found through the hand-finishing methods being used, other sources of help and information had to be researched.

Call For Help — Samples of various time-consuming parts were sent

to Roto-Finish Co., Kalamazoo, Mich., for analysis and finishing recommendations. Among them were several gear units and a number of intricate pieces of various sizes and shapes. They required finishing to highly exacting tolerances. After processing, the parts were returned in excellent condition, ready for use. They were accompanied by a detailed report of data and speci-



Worker pours media and compound into a barrel-finisher.

fications covering finishing processes recommended to do the job.

The first barrel finish machine, a four-compartment unit of 10 cu ft capacity, was purchased and installed at AiResearch. Following installation, the company sent its

Want More Data?
You may secure additional information on any item briefed in this section by using the reply card on page 119. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

finishing department foreman to Kalamazoo to work in the processing laboratories of the supplier.

Learn First-Hand—The job was to study at first-hand the equipment's features and learn methods for adapting them to various types of precision finishing operations. Most important was the data gathered on time cycles, loads and additives, and how to apply them properly in varying combinations to the finishing work required.

It became apparent that machine action will not touch or score on a flat, smooth surface. The mechanical barrel finishing method is at its best when the action is cutting down sharp edges or radius corners.

Reduces Rejects—The machine's users found that rejects of barrel finished items were less than one-sixth that of hand-finished items. Quality and quantity were uniform and results showed a high degree of improvement. Mechanical finishing further eliminated 50 pct of work on certain types of materials.

Proof of the value of the research program became quickly apparent when a quantity of 12,000 work pieces was mechanically finished in 2½ hours. Ordinarily, the same job would have required two weeks of one man's time working eight hours a day, six days a week, using hand-finishing methods.

Controls: Automatic Control Methods Up Bearing Quality

A manufacturer of precision anti-friction bearings is presently employing new automatic control techniques that result in substantial improvements in bearing quality. These control techniques are used on machines which produce precision needle rollers and other type precision rollers.

Now in use at The Torrington Co., Torrington, Conn., the new techniques were developed by Airborne Instruments Laboratory, Mineola, N. Y. They make use of a revolutionary device called an Inch-

NOW!

THE HIGH TEMPERATURE CHROME PLATING ADDITIVE

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New ZERO-MIST H.T.-2

*** IT STOPS MIST AND SPRAY COMPLETELY**

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You save money TWO ways with new Zero-Mist H.T.-2! Its DUAL-ACTION absolutely suppresses mist and spray in decorative chrome plating baths of any type and at the same time lowers the surface tension. You don't have excessive dragout—You don't lose solution in the air—You don't contaminate other plating solutions—You simplify your ventilation problems . . . and, Zero-Mist H.T.-2 maintains its efficiency at any operating temperature.

New Zero-Mist H.T.-2 is extremely economical too! Its DUAL-ACTION means faster make-up . . . and less maintenance and, it's stable forever, whether the solution is in use or standing idle.

For the economical, complete suppression of mist and spray in your decorative chrome plating baths . . . with the biggest savings in chromic acid solution, see your local Udylite representative today and start using New DUAL-ACTION Zero-Mist H.T.-2 right away.

the **udylite** corporation
detroit 11, michigan • world's largest plating supplier

TECHNICAL BRIEFS

worm motor. This motor, together with other equipment built by Airborne, inspects each roller as it's made. It determines whether the roller is of the necessary precision. Supplying the necessary corrective information, it actually adjusts the machine so as to correct any lack of precision in the parts it produces.

Aid Machine Operators — According to Torrington, the new techniques have relieved machine operators of a number of difficult tasks they were formerly required to perform. And they have actually resulted in a substantial improvement in the quality of the firm's bearings.

Using the new setup, the manufacturer is able to produce bearing rollers to within 50 millionths of an inch of any desired size.

Controls Grinder — The control system automatically guides the complete grinding operation on a No. 2 Cincinnati centerless grinder. This includes maintenance of part diameter to extremely close tolerances. It segregates parts into one of three grades: undersize, acceptable, or oversize.

This system utilizes the feedback control principal to accomplish automatic size control. Information, obtained from an electronic gage

NEW

L & J

HIGH SPEED

Multi-Duty Press

OPTIONAL EQUIPMENT

Oil shield. Air clutch. Left or right fly wheel mounting. Variable speed drive. Automatic feed. Automatic misfeed stop. Accurate top stop. Push button or dial speed controls. Electric speed indicator. J.I.C. wiring. Automatic lubrication. Stroke length and shut height to fit the job. Bronze gibs, etc.

Straight Side Punch Presses

Single and Double Crank

Versatile, fast for volume production of small parts with large or progressive dies. 20 to 150 tons.



NEW L & J CATALOG with complete specifications and construction features of 23 O.E.I. punch presses in geared and non-gear types from 14 to 90 ton capacities. Also, Straight Side Punch Press. Write for your copy now.

L & J PRESS CORPORATION

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ELKHART, INDIANA



The controls let this grinder work at 0.000001-in. accuracy.

measuring the diameter of the parts leaving the grinder, is converted into control signals. These are applied to the motor to correct the grinder. Machine variables, such as grinding wheel wear, and thermal expansions, are thereby automatically compensated for, resulting in accurate part size at all times.

The system functions without the aid of an operator except for initial set up and wheel dressing, when required.

Fabrication:

Steel Geodesic Dome
Houses Industrial Plant

Standing some 10 stories high, an all-steel circular building needs no internal supports.

Under construction in Baton Rouge, La., by Union Tank Car Co., Chicago, the geodesic structure will house regional maintenance and tank car repair facilities.

The dome is 375-ft across its in-

terior base and 116-ft high at the center. Total floor area enclosed by the dome is 110,000 sq ft. It's a clear-span dome, containing no internal supports whatsoever.

The first geodesic dome made entirely of steel, it will consist solely of 320 panels fabricated in 12 basic sizes and welded together.

Abrasives:

Sifters keep up quality of Abrasive Wheels

Maintaining uniform grain size in mass production of resin-bonded abrasive wheels at the modern Logan, O., Carborundum plant, presented quite a problem. Operating sequence called for mixing the various size grains with the resin binder at a central location; buckets then conveyed them to 86 molding stations.

The buckets discharge the grain-resin mixture into surge bins situated over the wheel molding machines. Here it is held until needed by the operator.

Run Into Trouble — Troubles arose because the pressure sensitive nature of the resin-bonded granules led to the formation of oversized agglomerates. These had to be screened out or broken up to maintain uniform grain size.

A variety of vibrating devices were tried without success. Then company engineers decided to install gyropedestal sifters at the discharge end of the bins. These sifters were supplied by Sprout, Waldron & Co., Muncy, Pa.

Does The Job — The high-speed gyratory action of these sifters breaks up the agglomerates and discharges a stream of uniform correctly sized free-flowing abrasive grains into the molds. All the material which cannot be broken up, or which is too large to pass through the mesh openings of the screen in the sifter is rejected.

Carborundum licked the problem by mounting 43 of these sifters so that each sifter could serve two hoppers.

Quality of melt masking your profit picture?



Chief Keokuk's masks usually meant trouble for the spooks. But Junior's hep to real quality! While Princess Wenatchee tom-toms the traveling music, he's bobbing about 'neath a mask of his own . . . one that's bound to bounce the evil spirits for good!

HIGH COSTS AND POOR QUALITY ARE REAL DEMONS

Send 'em scampering with Keokuk Silvery Pig Iron, the superior form of silicon introduction that helps foundries and steel plants control the uniformity of every melt. Handle by magnet, furnace-charge by weight, or count the pigs for equal accuracy. Aluminum producers, choose Keokuk Silicon metal every time!

*Keokuk Electro-Metals Company, Keokuk, Iowa;
Wenatchee Division, Wenatchee, Washington*



When you think of SILICON,
think of KEOKUK!

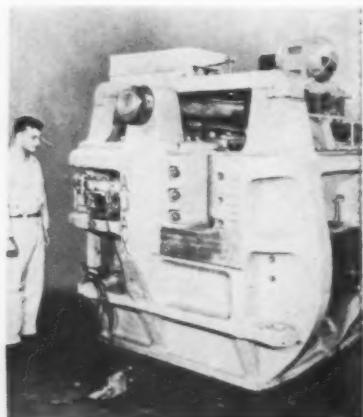
SALES AGENT: MILLER AND COMPANY
332 S. Michigan Avenue, Chicago 4, Illinois
3504 Carew Tower, Cincinnati 2, Ohio
8230 Forsyth Blvd., St. Louis 24, Missouri

Keokuk Silvery Pig—the superior form of silicon introduction—is available in 60 and 30 lb. pigs and 12½ lb. piglets in standard analysis or alloyed to your specifications. Silicon metal and ferro-silicon are supplied in standard sizes and analyses.



New Production Ideas

Equipment, Methods and Services

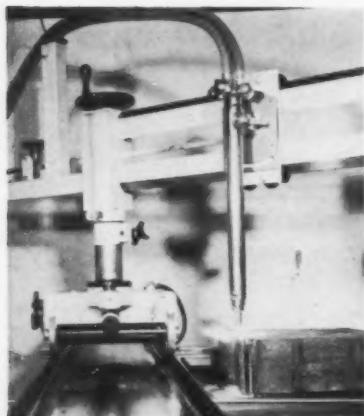


Forging Units Use Automatic Transfer Setup

A new 1½-in. forging machine employs a feed mechanism which transfers blanks automatically from the loading chute down through the forging operations. It accommodates various lengths of blanks ranging from 8 to 30 in. or longer. Diameter of the stock can vary from ½ to ¾ in., depending on the size of the upset. The unit heats a blank only on the end to be upset. Air actuated grips lower the blank through the die opera-

tions in the throat of the machine. The blank rotates between operations to assure uniform heading. Production is continuous, heading a bolt in two operations and completing a finished forging with every stroke of the machine. The unit shown here is a 3-in. machine. With this, round stock is transferred from the loading chute and lowered via a series of cams. (The Ajax Mfg. Co.)

For more data circle No. 41 on postcard, p. 119



Portable Machine Welds, Cuts, Flame-Treats

Electric motor-driven, this portable track-guided machine can be equipped to do automatic welding, cutting and heat-treating. The unit is designed to handle most requirements of metalworking shops and to supplement welding and cutting equipment in large fabrication plants. Available in two speed ranges to handle the general range of welding and cutting assignments, the machine effectively performs jobs such as: automatic

welding or cutting of steel plates; cutting of billets or blooms to length; automatic welding of longitudinal tank and pipe joints, railroad car sidings and long sections of sheet steel; heavy scrap cutting and heavy plate steel into strips or specific sizes. Its basic carriages can be equipped to do straight-line, bevel, and heavy-duty cutting with accessories. (National Cylinder Gas Co.)

For more data circle No. 42 on postcard, p. 119



Press Brakes Accurately Form Sheet Stock

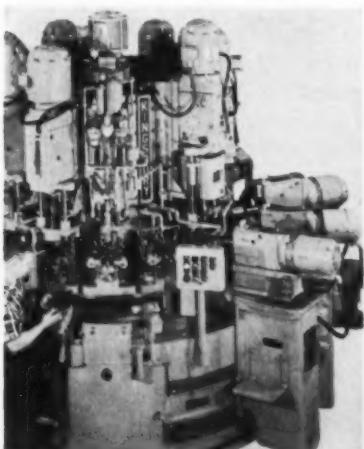
Efficient performance, low maintenance and ease of operation are reported for a new series of press brakes. Of sturdy welded steel construction, precision components enable them to perform accurate sheet metal forming operations. All movable parts feature ball-bearings or roller-bearings throughout. This practically eliminates operating friction. Only parts not using such bearings are alloyed bronze bearings on the alloyed steel forged and heat-treated bal-

anced eccentric crank shafts. The units also use heavy forged heat-treated steel pitman screws; these have buttress threads with revolving alloy bronze nuts designed not to jam. Their entire frame weldment includes a solid one-piece lower bed, machined after fabrication. This includes a ½ x 7/8-in. slot in the lower bed in exact alignment with the ram, allowing setting of large dies. (Service Machine Co.)

For more data circle No. 43 on postcard, p. 119

Transfer Unit

Seventeen units with 25 spindles mill, drill, ream, face, counterbore, countersink and tap at a gross rate of 300 parts per hour. A 63-in. index table holds 12 work fixtures with power clamping and automatic unclamping. On the center column are ten vertical units. Eight units



core drill and ream for large holes using anti-friction guide bushings. One unit mills a pad; it has provision for adjusting both the spindle and the mounting column. The last vertical unit and seven horizontal units on knees operate 16 tools on small holes. (Kingsbury Machine Tool Corp.)

For more data circle No. 44 on postcard, p. 119

Hot-materials Handler

Handling of hot materials is done by a new type vibrating conveyor. The conveyor is fabricated from iron and steel in its entirety. Such construction makes it possible to transport materials of extremely high temperatures without damage to the conveyor. The conveyor is a spring mounted trough. It's vibrated by an air powered drive mechanism mounted under the trough. About 20-psi air pressure is required to operate the conveyor. Among its features, the company claims, is low maintenance cost of the conveyor. There are no bearings, cams, couplings, motors, shafts or pillow blocks. (Cleveland Vibrator Co.)

For more data circle No. 45 on postcard, p. 119

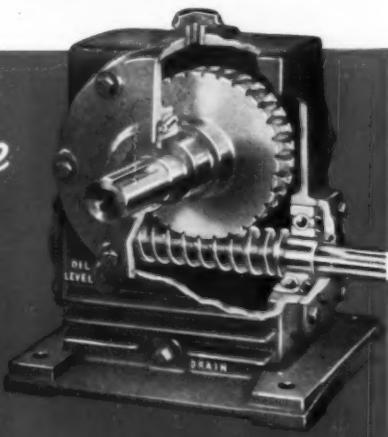
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- Alloy steel worm and shaft... carburized, hardened and ground.
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Advanced worm gear design and Foote Bros. precision production techniques make these new Hygrade Reducers the most efficient and economical power packages you can buy. And they're easier to select and buy, because Foote Bros. Distributors and Branch Warehouses carry them in stock ready for immediate delivery.

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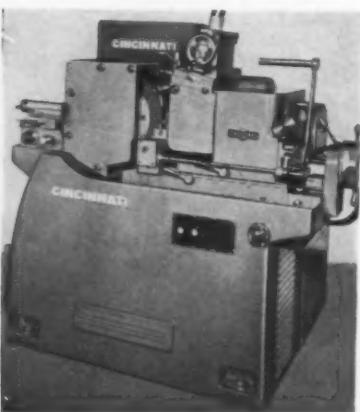


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FOOTE BROS.
Better Power Transmission Through Better Gears

NEW EQUIPMENT



Centerless Grinder Works 1 1/2-in. diam Pieces

Rated at 7 1/2 hp for its grinding wheel drive, this centerless grinding machine works pieces up to 1 1/2-in. in diameter. A key feature of the machine is use of special bearings for the grinding wheel spindle. These bearings consist of three segments. They automatically adjust for load and eliminate spindle flutter. The grinding wheel spindle is supported in a fixed mounting in the bed casting. A double-slide and swivel plate con-

struction between the regulating wheel and work rest can be positioned individually or together in relation to the grinding wheel. Through the swivel plate, it can be adjusted to compensate for slight errors of alignment in setup or truing. A central reservoir with a manual pump lubricates the ways for the regulating wheel pile. However, the machine can use automatic lubrication here. (Cincinnati Grinders, Inc.)

For more data circle No. 46 on postcard, p. 119

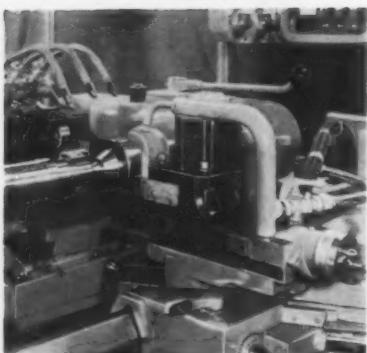


Ultrasonic Soldering Iron Fills Blowholes

Aluminum, magnesium and related alloys can be welded without using flux, thanks to this soldering iron. Employing ultrasonic principles, the soldering iron is also handy for applications where flux might corrode the item being joined. In operation, ultrasonic vibrations break the outside layer of metals and alloys that form refractory oxides. It enables such metals to be effectively soldered without

any special surface pretreatment. Additional applications include surface tinning and filling of blowholes in aluminum and magnesium castings, the soldering of light metal pipes or gutters which are not easily accessible for bench work, and installation of wave guides. The instrument can be used with electrically or gas heated tips. (Gulton Industries, Inc.)

For more data circle No. 47 on postcard, p. 119



Machine Tool Turret Actuates Hydraulically

This two-position automatic turret features hydraulic actuation. Designed to take two 1 x 1 1/2-in. tools, the turret indexes 180° to a stop in either direction. Its operation is entirely automatic. Control is supplied during machining by a multi-cycle programmer mechanism on one of its maker's automatic lathes; the unit is specifically designed for use with this machine

tool. A combination hydraulic and mechanical setup locks the turret in position. In normal operation, the turret is programmed to index just prior to the last cutting cycle. Thus one tool performs finishing exclusively. Programming however, can be varied to meet different machining requirements. (Monarch Machine Tool Co.)

For more data circle No. 48 on postcard, p. 119



Automatic Lathe Combines Rough, Finish Jobs

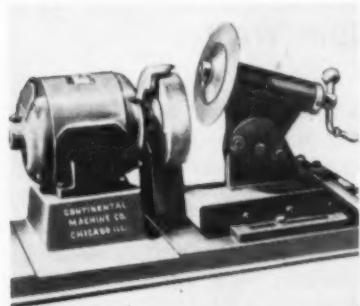
Completely automatic, this tracer lathe combines roughing and finishing operations. Here's how: the operator just loads the workpiece between centers and pushes a button. Multiple tools turn, then retract. Then the tracer tool finish-turns and retracts to the starting

position. The machine is now ready for re-loading. The setup teams-up the advantages of multiple tooling for rapid stock removal and single tool tracer turning for accurate finish operations. (Seneca Falls Machine Co.)

For more data circle No. 49 on postcard, p. 119

Wheel Grinder

A new bench model grinder is designed especially for sharpening pipe and tube rotary cut-off wheels. The machine grinds wheels to original sharpness. It has a manual bevel adjustment and set screw stop.



that permits exactly equal length bevels on both sides of the blade. The adjustable base compensates for grinding wheel wear. It sharpens 4½ to 8-in. wheels. An adapter is available for wheels smaller than 4½-in. diam. (Continental Machine Co.)

For more data circle No. 50 on postcard, p. 119

Furnaces

New tilting and stationary crucible furnaces melt non-ferrous metals. Interchangeable for oil or gas fuel, they are assembled and test fired to operating temperature before shipping. They feature a new cover - ventilating top construction which provides easy access to the entire bath. (Campbell - Hausfeld Co.)

For more data circle No. 51 on postcard, p. 119

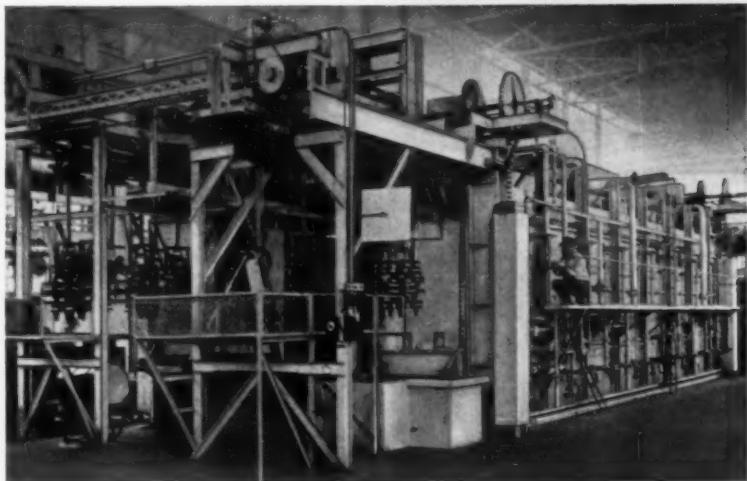
Squaring Shears

New 10-gage, precision power squaring shears handle continuous-power operations in production, at full rated capacity. Two new models, 4-ft and 6-ft capacity, feature massive machine-tool grade castings. They also have heavy fixed beam channel holddown, and safety square pin clutches. Single or repeat stroke operation (62 per minute) is possible with the 4-edge blade models. Timken bearings are provided on a high-speed shaft.

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EXPERIENCE PAYS OFF IN HEAT TREAT FURNACES

1958



1928



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Take, for example, the crankshaft heat treating furnaces illustrated above. Years of experience preceded the design and development of the old 1928 unit . . . and in its day it was one of the best, turning out a phenomenal 150 cranks an hour with just four operators.

Today, Holcroft is still building the best . . . as typified by the modern crankshaft unit above. Here, Holcroft has conveyor-integrated three separate units . . . each consisting of a hardening furnace, quench tank, draw furnace and cooling station . . . into a completely automated installation capable of heat treating 456 crankshafts an hour. And only two men are required to perform the *one* manual operation . . . transferring cranks from one conveyor to another at the central loading station. So you see, in production heat treat furnaces, Holcroft experience *does* pay-off, in better heat treating, more efficient operation, lower production costs than ordinary, perhaps less expensive furnaces, can give you.

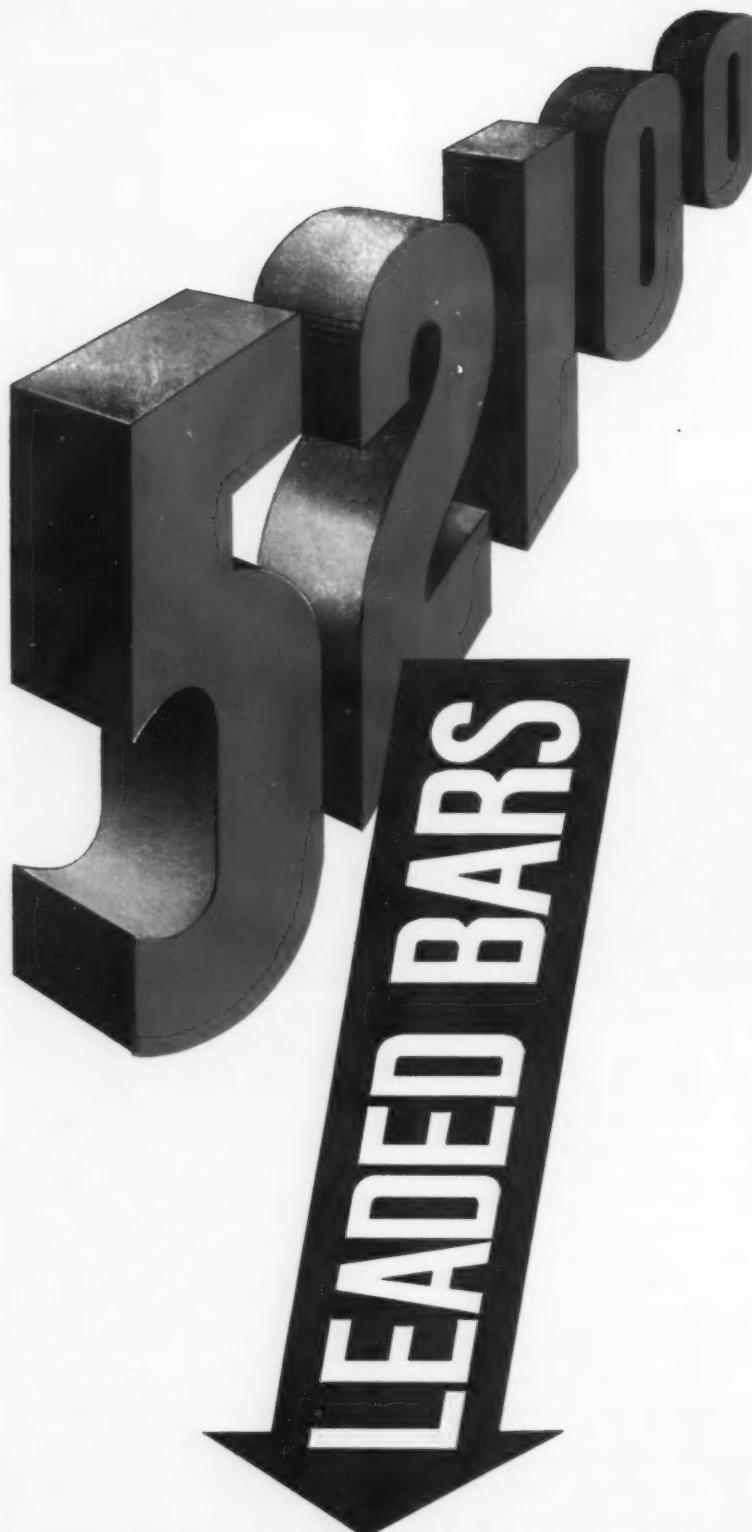
HOLCROFT AND COMPANY



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PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

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CANADA: Walker Metal Products, Ltd., Windsor, Ontario



PETERSON STEELS, INC.

Union, New Jersey • Detroit, Michigan • Chicago, Illinois

NEW EQUIPMENT

Built-in blade clearance precision gauging, and full length bed T-slots are other features. (Peck, Stow & Wilcox Co.)

For more data circle No. 52 on postcard, p. 119

Spot Welder

This general purpose welder is designed to stand up under rugged shop conditions. The rocker-arm spot welder uses materials, design and construction ordinarily found only in welders built to aircraft industry standards. The frame is unusually rigid; control is transistorized with plastic coated printed



circuitry and plug-in components. It handles general purpose applications where relatively light gage metals are fabricated. Models are available in standard "O" size frame, with 30 or 50-kva transformers. Throat depth can be varied by a choice of six arm lengths—ranging from 12 to 42 in. (Sciaky Bros., Inc.)

For more data circle No. 53 on postcard, p. 119

Spiral-point Tap

A continuous spiral point tap with multiple chamfer sections features long life due to a design which forces lubricant to its cutting edge. It also pushes chips ahead of the tap, eliminating chip clogging of the flutes. The tap is available with single or multiple chamfer sections.

Thus, an entirely new cutting section, including the proper chamfer and spiral point grind, may be obtained without resharpening equipment or replacing with a new tap. It's available in machine screw sizes 6, 8 and 10 for shallow hole depth threading. (Beloit Tool Corp.)

For more data circle No. 54 on postcard, p. 119

Mist Coolant

Using a gravity feed principle, a new centralized mist cooling system supplies pre-mixed coolant to any number of machines from a single supply source. The injector valve on the water supply line permits tank refill from floor level. Ratio of the mixture is governed by size of the tank and the amount of concentrate dilution. Individual control valves are mounted on each machine, convenient to the operator for immediate and precise control of air and coolant mixture. (Aetna Mfg. Co.)

For more data circle No. 55 on postcard, p. 119

Hydraulic Cutter

Among uses of a new hydraulic guillotine cutter is the retrieving of floating mandrel in cold tube reduction work. Because of the clean cut achieved, chips and abrasive dust are gone from subsequent drawing processes. Portable, the tool can be taken to the coil. Also for production or maintenance cutting, the unit has a capacity of 2-in. OD x 32 wall annealed copper or brass tubing or 2-in. OD stranded copper wire. (Manco Mfg. Co.)

For more data circle No. 56 on postcard, p. 119

Stub Taps

Designed to solve problems encountered when using standard taps in screw machines, a new type spiral flute stub tap has good shearing action and chip "ride-out." In addition to spiral fluting, a section immediately behind the threads is necked down to below the root diameter. This "necking" provides efficient chip room, reduces drag and

Do you need better ways
to strip paint?

When tough finishes resist your present stripping methods, you may need help on some of these problems:

- 1 How to strip oil-base paints . . . synthetic enamels . . . alkali-resistant plastics . . . resin-base paints . . . japans . . . wrinkle finishes . . . nitrocellulose lacquers . . . alkyls . . . phenolics . . . ureas.
- 2 How to strip zinc chromate primers without etching aluminum.
- 3 How to strip paint from vertical surfaces and undersurfaces where thin-bodied strippers run off without doing their work.
- 4 How to strip metal parts that are too large to be soaked in tanks.
- 5 How to strip paint, pigment residues, phosphate coatings and rust in one operation.
- 6 How to strip paint from rejects, conveyor chains, racks and hooks in continuous operation.



Oakite has more than a dozen fine stripping materials for these and similar jobs.

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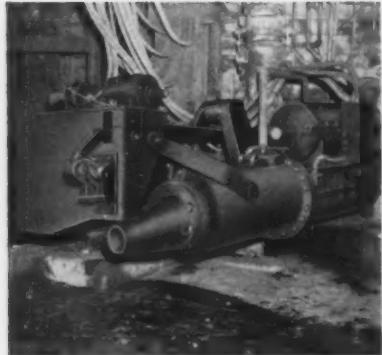
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With clay pressures of 600 psi, these guns provide ample power for plugging and maintaining long tapping holes. A unique mounting and operating system assures fast and accurate positioning with the ultimate in safety.

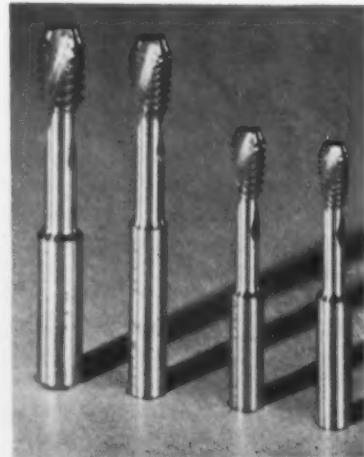
Bailey Electric Plunger Clay Guns are adaptable to both blast furnaces and large electric furnaces.

Write for Bulletin



TECHNICAL BRIEFS

speeds cutting oil or coolant to cutting edges. The stub taps have a very short threaded section and short overall length. Shanks are ground to standard fractional dimensions and conform to National



Screw Machine Products Association standards. Three styles come in machine screw sizes No. 2 through 10, in both coarse and fine series. (Jarvis Corp.)

For more data circle No. 57 on postcard, p. 119

Foundry Lube

A new lubricant and rust inhibitor prevents metal-to-metal contact, eliminates or reduces stickers and toxic fumes. It stays on metal insuring complete lubrication where needed. For use in diecasting, forging, drawing, and stamping, the product will not clog spray systems, affect the metal or operating personnel. It doesn't form scale, sludge or mess around machines. Remaining on surfaces up to 3000°F, it may be removed completely by using plain water, alkali solutions or solvents. (Harry Miller Corp.)

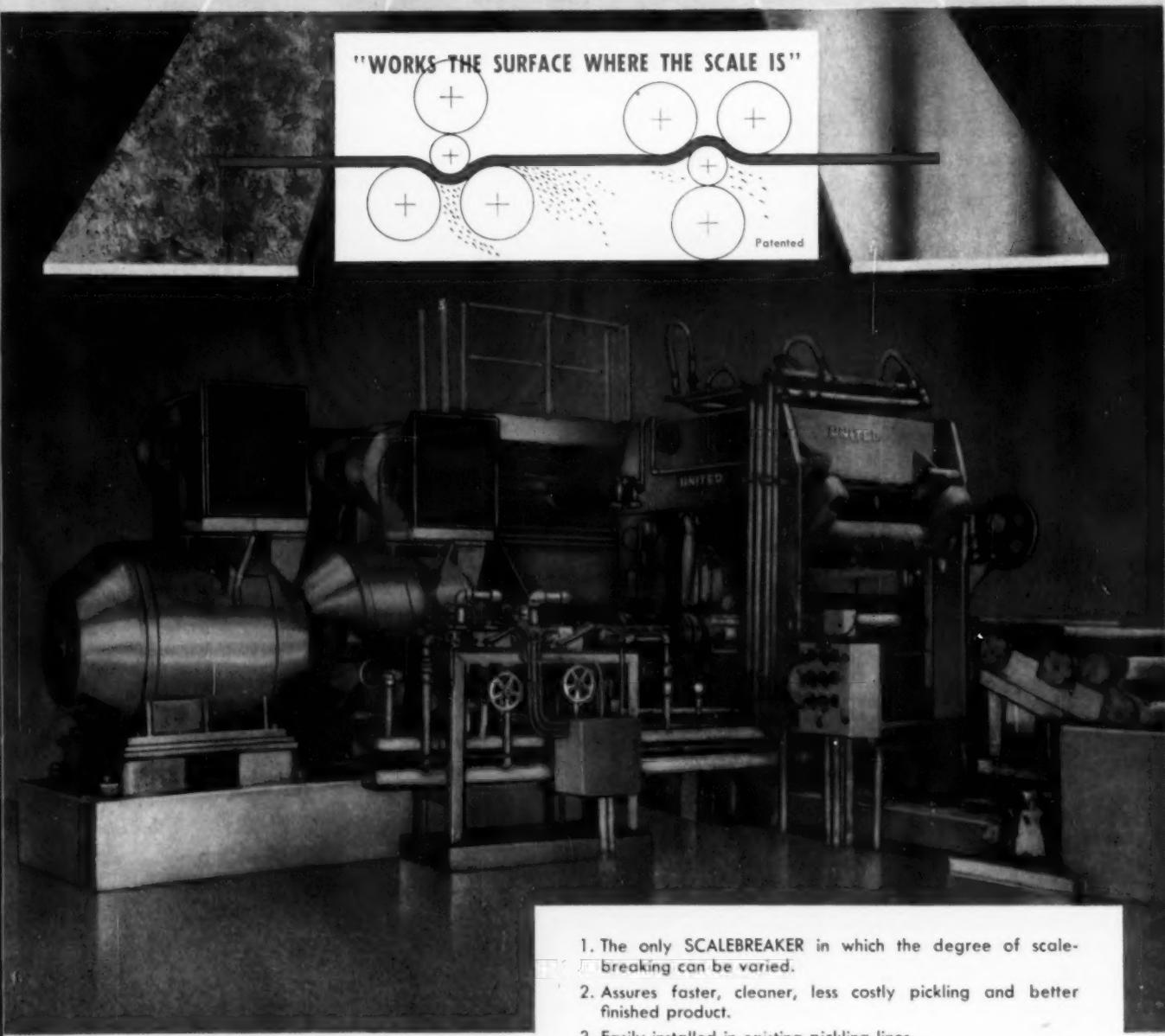
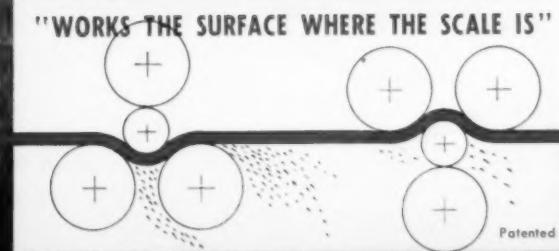
For more data circle No. 58 on postcard, p. 119

Cap Nut

Threaded cap nuts of a new type are diecast from zinc alloy. They have integral washer bases, which eliminate need for separate washers. From the base of the hex to the crown, the washer base cap nuts

UNITED

NEW *Strip Processing* SCALEBREAKER



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How the purity of Electromanganese® eliminates steel-making "bargains" that cost money

In theory few metallurgists will argue that pure Electromanganese® makes a better steel additive than manganese alloys that are contaminated with elements detrimental to the finished product.

In practice, however, metallurgists may frequently choose alloys that contain the manganese they want

as well as elements they don't want, can't use, and would be better off without! *Their reason*: it's cheaper! *Their problem*: getting rid of the undesirable elements . . . if they can. *The result*: for the most part, adequate but less-than-the-best quality in the finished product.



But let's take a *good* look at the price tag. Are contaminated manganese alloys really cheaper than the pure element? Today's cost difference between other manganese alloys and pure Electromanganese is only a few pennies. This small differential is easily overcome. For example, commercial use of carbon- and silicon-free Electromanganese in low carbon aluminum killed sheet steel shows potential economic and quality advantages in the following areas:

1. Improved furnace and deoxidation practice
2. Improved deep drawing characteristics
3. Improved sheet quality; i.e., fewer surface rejections

R E S U L T : better quality at lower cost for you and your customers.

When you buy Electromanganese—Foote's electrolytic manganese, guaranteed 99.9% pure—you improve steel quality, cut down rejects, and end up with real dollars-and-cents savings. A Foote engineering representative is ready to tell you about

actual case histories in other plants . . . help you work out what you might expect in your own. Until then, Bulletin 201 will give you more details on Electromanganese, the special Hydrogen-Removed Grade (H:7.5ppm), and Nitrided Grades.



Write Technical Literature Department, Foote Mineral Co.,
438 Eighteen West Chelten Building, Philadelphia 44, Pa.

ELECTROLYTIC MANGANESE METAL • NITRELMANG • HYDROGEN-REMOVED ELECTROMANGANESE • RIMEX
MANGANESE SULPHIDE • WELDING GRADE FERRO ALLOYS • COMMERCIAL MINERALS AND ORES
LITHIUM METAL, CHEMICALS, MINERALS • ZIRCONIUM, TITANIUM, HAFNIUM (IODIDE PROCESS)

are similar to regular cap nuts. They provide substantial seating area, plus other design and production advantages. Because of the considerable mating area provided by



the washer base, the units have a firm "grip" on the surface. They thus aid in preventing loosening of assembled parts. (Gries Reproducer Corp.)

For more data circle No. 59 on postcard, p. 119

Waste Disposal

If trash is a problem at your plant, maybe this will interest you. It's a new mechanized waste handling system. The setup converts all paper, garbage, glass, card-



board, cellophane, pliofilm, waxed containers, books and other types of waste into a greatly reduced (in size) odorless pulp. This pulp is semi-dry and easily removed. Use of such a setup spells goodbye to hauling of garbage cans, cartons of waste paper and junk. Eliminating these means less fire hazards. The

system also does away with hauling of bulky waste over long distances for removal. Basically, it consists of a pulper, a pump and an extruder. Pushbutton controlled, the pulping unit sets-up wherever trash accumulates. It can be installed to discharge pulp through a window or other opening to an outdoor container. (Conservomatic Corp.)

For more data circle No. 60 on postcard, p. 119

Hammers

Industrial hammers in a new line include "soft-faced," "dead blow," "solid head"; also demountable



NEW EQUIPMENT

head with rawhide or nylon faces. Rawhide mallets are also included. Faces on the hammers are replaceable and interchangeable in both "soft-faced" industrial and "dead blow" tools. They come in seven different hardnesses. (Nicholson File Co.)

For more data circle No. 61 on postcard, p. 119

Hardness Tester

A new Brinell tester makes hardness tests on parts hitherto beyond the capacity of a standard testing machine. Designed especially to make end tests on cylinders, die blocks, large castings, etc., the machine has a capacity of 29 in. or more with a throat of 3½ in. The instrument weighs only 45 lb and can be used in any position. It is completely portable. It uses a 5- or 10-mm carbide ball with any load ranging up to 3000 kg. (King Tester Corp.)

For more data circle No. 62 on postcard, p. 119

NON-FLUID OIL

TRADE MARK

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PREVENTS OIL-SOAKED INSULATION

Oil-soaked insulation, caused by ordinary oil, is eliminated when you use NON-FLUID OIL. It allows motors to run longer, cooler and cleaner.

NON-FLUID OIL lasts longer in every type of equipment because it remains where applied until entirely consumed, providing better lubrication at less cost per month-per year.

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precise heat for precision casting

You'd expect the accurate heat of an induction furnace to be an important consideration in permanent mold, shell mold, and investment casting . . . and it is! But in addition to precise temperature control, Ajax-Northrup high frequency induction furnaces provide the precision foundry with *flexibility, purity, and economy*. That's why Ajax leadership in melting for precision casting has never been challenged.

One furnace—hundreds of alloys: Ajax-Northrup furnaces can handle any one or all of the hundreds of ferrous and non-ferrous alloys being made today. For many alloys, it's the only furnace that can be used. Magnet alloys, for example, depend on the inherent stirring action which assures ideal dispersion of all elements

throughout a melt . . . and the most uniform possible cast part analysis.

Pure metal protects part quality: There's no flame, no smoke, no physical contact between coil and metal. Melts are always 100% on analysis, because there's no chance of contamination . . . particularly important when you're dealing with the finicky alloys common in precision casting.

A better melt at a lower cost per melt: Because every melt is uniform and to exact composition, bad melts become a thing of the past. Subsequent machining is minimized. Ajax-Northrup's unique control system assures maximum melting efficiency—lower melting costs. And new, compact designs minimize floor space requirements, installation costs and maintenance.

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The Iron Age Summary

Look for Steel Price Rise in July

Steel business may be slow. But you can discount rumors that prices won't rise.

Some steel men figure their wage costs will go up 20¢ an hour under labor contracts.

■ In spite of the gloom in steel this week, there is no foundation to rumors that steel prices will not rise again this summer when higher wage costs take effect under steel labor contracts.

Rumors in some quarters that there will be no price increase in July do not stack up with the fact that some steelmakers see their wage costs going up 20¢ an hour this year—not counting a possible wage increase under the cost-of-living clause in steel labor contracts.

Let's Face Facts—One thing not generally understood is this: The steel contracts run until 1959, and call for a wage rise next July 1. They cannot be rescinded unless Dave McDonald, head of the steel

union, says so—and this would be suicide for him. So logic favors a price increase, and for that reason some steel users are going to lay up a little steel as a hedge before July 1. They figure there will be an increase ranging from \$5 to \$7 per ton.

Meanwhile, the mills have little to cheer about. Their markets for the most part are moving sideways at a low level. But one big marketing area—construction—is beginning to show signs of life.

Construction Pickup—Reports from more than one steelmaking district indicate that the products that go into construction—heavy plate and structural—are looking up. These products are still being turned out at depressed levels, but definite gains are looked for in the second quarter.

Apart from construction, the news in steel is uniformly bad. Steel order volume shows no basic improvement. New orders are up one

week, down the next. Actual orders placed in March will not be much if any better on a daily basis than they were in February.

Shaky Optimism—“The order book is making slow and late,” is the way one steel man put it. He looks for a slight improvement in the spring but no real upswing before late summer. Even predictions of a spring pickup are based more on hope than fact. It's just that these steel men figure things can't get worse; they should get better.

There's no help in sight from the automotive industry. Steel salesmen in Detroit are beginning to discount speculation that the automakers might stock up on cars in anticipation of a strike this summer.

Auto Strike Odds Drop—Since the beginning of the year, the odds have changed from favoring a strike to no strike. With car stocks already over the 900,000-unit mark, the industry could take a fairly-prolonged strike without feeling it too much.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month Ago	Year Ago
Ingot Index (1947-1949=100)	88.1	91.1	85.5	149.8
Operating Rates				
Chicago	56.0	58.0*	59.0	88.0
Pittsburgh	56.0	54.0*	55.5	95.0
Philadelphia	56.0	56.0	63.0	103.0
Valley	41.5	45.0*	39.0	94.0
West	73.5	73.5*	72.5	101.0
Buffalo	37.0	37.0	44.0	95.0
Cleveland	30.0	37.0*	30.0	91.0
Detroit	42.0	47.0*	51.0	94.0
S. Ohio River	54.0	51.0*	50.0	85.0
South	47.5	49.5	49.5	99.0
Upper Ohio R.	75.0	77.5*	60.0	94.0
St. Louis	72.0	85.0*	83.0	102.0
Northeast	31.0	31.0	31.0	66.0
Aggregate	...	54.2	50.9	94.0

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)				
	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	\$66.49	\$66.49	\$66.49	\$64.56
Scrap, No. 1 hvy (Gross Ton)	\$36.33	\$37.33	\$37.33	\$48.17
No. 2 bundles	\$27.17	\$28.50	\$28.83	\$39.17
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	25.00	25.00	25.00	32.00
Lead, St. Louis	12.80	12.80	12.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	95.00	95.00*	93.625	99.50
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Many Improved Valves on Market

A buyer has a wide choice of valve products to choose from today.

Latest designs make more use of plastics in working parts to minimize leakage.

■ A few random telephone calls should bring a stampede of valve salesmen into any purchasing agent's waiting room. They will bring with them a bumper crop of new and improved valve designs and promises of quick, if not immediate, delivery.

A sampling of valve manufacturers shows that for the most part, sales are holding close to last year's levels. One large Midwest producer of safety and relief valves reports its overall sales are holding

steady—although modestly below 1957 first quarter bookings.

The Predictions—One sales manager explains: "We do not expect any further decline for 1958 in view of the fact that when our commercial and industrial bookings fall off, a noticeable pickup occurs in the military requirements which have accelerated recently."

Another company reports: "Our outlook for 1958 as a company is one of optimism. And although we have suffered a slight decline in the first two months of this year, we anticipate a rallying of sales and expect to finish the year about as well as we did in 1957."

Price Hikes?—There is some half-hearted talk of price increases in the months to come but much of it sounds like sales talk. Some salesmen may still try to use the

price hike gimmick to prod hesitant buyers to order now.

There are many interesting new valve products on the market.

Marsh Instrument Co., Skokie, Ill., within the last three months has improved its stainless steel needle valves by including a Teflon packing. This packing is part of the Marpak Packing System, which permits the valve to be used at the 10,000 lb maximum working pressure and at temperatures ranging from -100° to $10,000^{\circ}\text{F}$ at all working pressures.

Oil Country Report—More new products for the petroleum, gas, and chemical industries are being introduced by W-K-M Div. of ACF Industries, Houston. Included are a non-lubricated ball valve, a triple completion valve, and a reduced port valve.

W-K-M's new ball valve is leak-proof. It can be installed in the line with the flow in either direction because the ball is suspended under compression between Teflon seats. Six years of field tests have proved this new product effective for use in high octane gasolines, butane and propane, alkalis or caustics, synthetic fuels, alcohol, and helium, the company says.

More Improvements—The triple-completion valve incorporates three 2-in. through-conduit gate valves on a single body, making it possible to bring in wells at three different levels.

Kunkle Valve Co., Fort Wayne, Ind., recently introduced new spring-loaded air and gas safety valves for pressure settings up to 10,000 psig. Improvements incorporate the use of plastic or semi-plastic materials in the working parts of air-gas relief valves to minimize leakage.



VALVE PARADISE: This complex yet accessible sheet mill piping installation at Jones & Laughlin Steel Corp. was made possible through wise choice of valves. It was engineered by the Power Piping and Sprinkler Div. of Blaw-Knox Co. to supply heat, lubrication, and operating control.



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In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

Heavy Steel Expects Seasonal Pickup

Sales of plates and shapes should improve as construction season gets under way.

However, other market areas, including fabricating and line-pipe, remain weak.

■ Cautious optimism prevails among producers of heavy steel products. Although supplying the strongest steel market which exists, they are crossing fingers about the second quarter outlook.

It's expected that construction work will bolster plate and shape sales next quarter. If Washington takes action to spur highway and home building, sales prospects will be even brighter.

As yet, seasonal improvement in heavy steel due to construction activity hasn't arrived. While sales of light structurals and angles have picked up in some areas, heavy standard and wide angle beams continue slow.

Fabricating Weak—Shipbuilding remains a market bulwark. But sales to other industries—including the railroads, tank and pressure vessel builders—are at low ebb. Structural fabricators are still paring inventories. And both plate and structural fabricators report business is poor. Buyers, in an effort to cut costs, are doing all the work they can.

Plate mills which turn out line-pipe have been dealt a body blow by the Memphis decision. Some just ran out the remaining orders on their books and closed down operations.

Overall prospect for plate and shapes: A fair second quarter, bolstered by seasonal buying.

Sheet and Strip—Slow automotive ordering dug a pit under March sales hopes. And it appears to be undermining prospects for April. Other users continue operating with low inventories and counting on steel suppliers for fast deliveries. Midway through the month mills are still out looking for cold-rolled sheet orders for March delivery. Producers are speculating that when the latest round of automotive deferrals and cancellations ends the market will improve.

U. S. Steel announces volume production of normalized enameling steel at its Irvin Works. Previously production was limited to cut sheets. The new facilities turn out USS Vitrenamel in coils from 16 to 22 gauge, from 24 to 60 inches wide, and up to 50,000 lb in coil weight.

Jones & Laughlin is producing electrolytic zinc coated sheets at its Youngstown strip steel division. Prices of the new products, in cents per lb: electrolytic zinc coated sheets—7.275; electrolytic zinc coated sheets, chemically treated—7.275; cold-rolled sheets, electrolytic zinc flash coated, chemically treated—7.00; and hot dipped galvanized sheets, chemically treated—7.00.

PURCHASING AGENT'S CHECKLIST

Warehouses expand the net pricing system. **P. 60**

Stainless steel has great potential for aircraft and missile use. **P. 62**

Plastic coated pipe gets new applications in the oil and chemical industries. **P. 65**

Superior Steel Div. of Copperweld Steel Co., effective Feb. 20, reduced its base prices of copper clad strip. New prices are cold-rolled clad, 10 pct, 2 sides—\$38.75 per 100 lb, and cold-rolled clad, 10 pct, one side—\$33.10 per 100 lb.

Galvanized Sheet—Production of galvanized sheet in the **Cleveland** area will be cut back severely for several weeks. Reason is shutdown of Republic Steel's electrolytic line due to an electrical failure. Most production of wide sheet is affected, but smaller widths are still being turned out at the company's Niles, Ohio, mill.

Bar—Slow automotive ordering is ham-stringing hopes for a pickup. Non-automotive users are more active, but cutbacks from **Detroit** are slowing sales. Generally, the drop in the bar market seems to be leveling off. Producers report that sales for the past few months have continued at about the same rate. As in sheet, some improvement in automotive buying is hoped for in the second quarter.

Timplate—Can makers have told mills they will take healthy tonnages during the second half of 1958. This comes on top of a first quarter which was better than expected. The mills are still cutting down on inventories. One producer feels hot dipped shipments may stabilize at a minimum level this year.

Pipe and Tubing—Standard pipe orders are showing some seasonal pickup due to construction. However, seamless pipe is being carried in mill stocks to speed up deliveries in a bid for orders. Large diameter welded pipe remains stalemated by the Memphis decision. **Midwest** mills are scrounging around trying to gather enough second quarter tonnage to keep mills in operation. **Eastern** producers are turning to the export market for sales.

Rails—Production of rails at the No. 2 mill of U. S. Steel's Edgar Thomson Works will be suspended May 30 due to a lack of orders. The suspension will extend to the rail mill's supporting facilities.

COMPARISON OF PRICES

(Effective March 18, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in Italics.

	Mar. 18 1958	Mar. 11 1958	Feb. 18 1958	Mar. 19 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	6.12	6.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stain'l's C-R strip (No. 302)	52.00	52.00	52.00	50.00

Tin and Terneplate: (per base box)				
Terneplate (1.50 lb.) cokes	\$10.30	\$10.30	\$10.30	\$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. terne	9.55	9.55	9.55	9.20

Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50

Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢

Rails: (per 100 lb.)				
Heavy rails	\$5.525	\$5.525	\$5.525	\$5.275
Light rails	6.50	6.50	6.50	6.25

Semifinished Steel: (per net ton)				
Rerolling billets	\$77.50	\$77.50	\$77.50	\$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00

Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225

Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.670¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	March 18 1958	March 11 1958	Feb. 18 1958	March 19 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$70.97	\$70.97	\$70.97	\$68.88
Foundry, Valley	66.50	66.50	66.50	65.00
Foundry, Southern Cln'ti	73.87	73.87	73.87	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	65.00
Basic, del'd Philadelphia	70.47	70.47	70.47	68.38
Basic, Valley furnace	66.00	66.00	66.00	64.50
Malleable, Chicago	66.50	66.50	66.50	65.00
Malleable, Valley	66.50	66.50	66.50	65.00
Ferromanganese, 74-76 pct Mn, cents per lb†	12.25	12.25	12.25	12.75

Pig Iron Composite: (per gross ton)

Pig iron \$66.49 \$66.49 \$66.49 \$64.56

	March 18 1958	March 11 1958	Feb. 18 1958	March 19 1958
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$36.50	\$37.50	\$36.50	\$49.50
No. 1 steel, Phila. area	38.00	38.00	38.00	51.50
No. 1 steel, Chicago	34.50	36.50	37.50	43.50
No. 1 bundles, Detroit	29.50	32.50	29.50	41.50
Low phos., Youngstown	38.50	38.50	38.50	48.50
No. 1 mach'y cast, Pittsburgh	51.50	51.50	49.50	54.50
No. 1 mach'y cast, Phila.	49.50	49.50	47.50	55.50
No. 1 mach'y cast, Chicago	48.50	48.50	49.50	48.50

	March 18 1958	March 11 1958	Feb. 18 1958	March 19 1958
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	\$36.33	\$37.33	\$37.33	\$48.17
No. 2 bundles	27.17	28.50	28.50	39.17

	March 18 1958	March 11 1958	Feb. 18 1958	March 19 1958
Coke Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$15.38	\$15.38	\$15.38	\$15.38
Foundry coke, prompt	\$17.50-\$19	\$17.50-\$19	\$17.50-\$19	\$17.50-\$19

	March 18 1958	March 11 1958	Feb. 18 1958	March 19 1958
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	25.00	25.00	25.00	22.00
Copper, Lake, Conn.	25.00	25.00	25.00	32.00
Tin, Straits, N. Y.	95.00†	95.00*	95.625	99.50
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	12.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. * Average. * Revised.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Demand Off, Market Drops Again

Added weakness hit the market again, with declines in most consuming areas.

Optimists hope for an upturn in steel operations. Otherwise, the decline may continue.

■ The market was in retreat this week, with much of its late winter gains in danger of being wiped out.

Unless more significant mill buying occurs, the market may be edging back to the bottom again. Mills show little interest, and dealer resistance, although strong, has had to yield in most markets.

The Chicago market, which showed a weak spot last week, dropped again this week. Pittsburgh also weakened, with major consumers remaining out of the market.

On the East Coast, export took on a doubtful tone, giving coastal markets an added degree of uncertainty.

Scrap remains in short supply in most markets. This factor has kept prices from dropping further. But with better weather, flow of scrap to dealers is expected to pick up slightly. Unless compensated for by increased mill purchases, the market could weaken even more.

The trade is keeping a close eye on steel mill operations, with only a possible seasonal upturn in steel producing seen as a stimulant to the market.

Pittsburgh—Prices of best grades are down \$1 as local consumers remain out of the market and the activity of nearby districts has subsided. No. 1 heavy melting, No. 1

factory bundles, low phos, and No. 1 railroad heavy melting are all down \$1. Secondary openhearth grades had risen very little in the recent flurry and are holding at levels that seem to be near bottom. A price of \$29 for No. 2 bundles is meeting dealer resistance. The whole market has a weaker tone.

Chicago—Prices slipped again despite considerable continuing dealer resistance to the drop in broker buying prices. Attempts started two and even three weeks ago to buy No. 2 heavy from dealers at \$33 began to produce some fair results this week. Cast continues to show considerable strength. Scrap, including stainless, continues to move out of the area on newly written orders.

Philadelphia—Failure of latest export cargo to take No. 2 bundles plus a beclouded export picture have combined to give the market a weaker tone. The price structure held, however, on orders of at least one mill at quoted prices. Turnings, which have been without new orders for some time, are off \$2 on appraisal. Cast is firm.

New York—Steelmaking grades remain quiet, with export orders continuing to bolster the market. Turnings business is virtually at a standstill and stainless demand is very low. Cast demand has perked up, with price gains as high as \$2 on recent buys by pipe foundries.

Detroit—A sale of some 14,000 tons of scrap, mostly No. 1 bundles, by a large industrial plant to an undisclosed buyer has most dealers edgy. Price was not disclosed,

further confusing the picture. Lacking sales for concrete pricing, dealers and brokers say the market is definitely softening, with prices off on appraisal.

Cleveland—Recent orders are being covered with difficulty by brokers as dealers hold out for their price. Overall tone of the market continues weaker, however, with no major new sales and with additional furnaces being cut back.

St. Louis—Mills are buying at unchanged prices, apparently feeling that lowered prices would stifle collections. No. 2 dealer bundles are even up \$2 and rerolling rails, of which there is a shortage, are up \$1. Demand for cast has slackened.

Birmingham—The market is still limited, with many mills apparently well supplied. The flow to mills seems to be a little better at prices now being paid, but some brokers believe when present needs are filled the market may sag again. With the return of good weather, dealers say more scrap is coming into the yards. The electric furnace market has slowed. Although cast is not very active, one consumer raised its price \$1. Export continues quiet.

Cincinnati—Tonnage is continuing to move on old orders, but outlook is somewhat dim for next month. Dealers are letting go of more tonnage at new prices. Foundry market continues weak.

Buffalo—Prices are unchanged in a dormant market. Mills are not interested in making purchases now. Yard workers are just keeping equipment from gathering rust.

Boston—This market continues almost without activity. There is no export or domestic demand to speak of and no change in prices.

West Coast—Prices are not too firm. Mills in all three consuming areas are buying only the little bit they need for current depressed operations. Outlook for export is bleak.

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SCRAP PRICES

(Effective March 18, 1958)

Pittsburgh

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	40.00 to 41.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and ms. turn.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. punch'gs plate	40.00 to 41.00
Heavy turnings	33.00 to 34.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	51.00 to 52.00
Rails 2 ft and under	55.00 to 56.00
RR steel wheels	48.00 to 49.00
RR spring steel	48.00 to 49.00
RR couplers and knuckles	48.00 to 49.00
No. 1 machinery cast	51.00 to 52.00
Cupola cast	44.00 to 45.00
Heavy breakable cast	42.00 to 43.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	110.00
430 bundles and solids	110.00 to 115.00
410 turnings	60.00

Chicago

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	39.00 to 40.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. forge crops	49.00 to 50.00
Low phos. punch'gs plate	44.00 to 45.00
Low phos. 3 ft and under	42.00 to 43.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	49.00 to 50.00
Rerolling rails	55.00 to 56.00
Rails 2 ft and under	55.00 to 56.00
Locomotive tires cut	48.00 to 49.00
Cut bolsters & side frames	45.00 to 46.00
Angles and splice bars	49.00 to 50.00
RR steel car axles	56.00 to 57.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast	48.00 to 49.00
Cupola cast	41.00 to 42.00
Heavy breakable cast	39.00 to 40.00
Cast iron brake shoe	39.00 to 40.00
Cast iron wheels	36.00 to 37.00
Malleable	52.00 to 53.00
Stove plate	39.00 to 40.00
Steel car wheels	46.00 to 47.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	100.00 to 110.00
430 turnings	50.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	\$37.50 to \$38.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.50 to 38.50
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.50 to 38.50
Machine shop turn.	18.00 to 19.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	32.00 to 33.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft and under	43.00 to 44.00
Low phos. punch'gs	43.00 to 44.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	33.00 to 34.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	58.00 to 60.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	43.00 to 44.00
Cast iron car wheels	40.00 to 41.00
Malleable	60.00 to 62.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	15.00 to 16.00
Low phos. 18 in. and under	40.00 to 41.00
Rails, random length	44.00 to 45.00
Rails, 18 in. and under	54.00 to 55.00
No. 1 cupola cast	40.00 to 41.00
Hvy. breakable cast	33.00 to 34.00
Drop broken cast	47.00 to 48.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	34.00 to 35.00
No. 1 factory bundles	39.00 to 40.00
No. 2 bundles	23.00 to 24.00
No. 1 bushelings	34.00 to 35.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut struct'r'l & plates, 2 ft & under	42.00 to 43.00
Drop forge flashings	34.00 to 35.00
Low phos. punch'gs. plate	35.00 to 36.00
Foundry steel, 2 ft & under	33.00 to 39.00
No. 1 RR heavy melting	42.00 to 43.00
Rails 2 ft and under	58.00 to 59.00
Rails 18 in. and under	57.00 to 58.00
Railroad grade bars	17.00 to 18.00
Steel axle turnings	20.00 to 21.00
Railroad cast	49.00 to 50.00
No. 1 machinery cast	48.00 to 49.00
Stove plate	45.00 to 46.00
Malleable	60.00 to 61.00
Stainless	
18-8 bundles	165.00 to 170.00
18-8 turnings	90.00 to 95.00
430 bundles	100.00 to 105.00
430 turnings	40.00 to 45.00

Buffalo

No. 1 hvy. melting	\$28.00 to \$29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Structurals and plate, 2 ft and under	37.00 to 38.00
Scrap rails, random lgth.	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knuckles	33.00 to 34.00
No. 1 machinery cast	45.00 to 46.00
No. 1 cupola cast	40.00 to 41.00

St. Louis

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
No. 1 RR hvy. melting	38.00 to 39.00
Rails, random lengths	48.00 to 49.00
Rails, 18 in. and under	54.00 to 55.00
Angles and splice bars	47.00 to 48.00
Std. steel car axles	52.00 to 53.00
RR specialties	44.00 to 45.00
Cupola cast	45.00 to 46.00
Heavy breakable cast	32.00 to 33.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	35.00 to 40.00
Cast iron car wheels	37.00 to 38.00
Rerolling rails	56.00 to 57.00
Unstripped motor blocks	35.00 to 36.00

Birmingham

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	37.00 to 38.00
Bar crops and plate	40.00 to 41.00
Structural and plate, 2 ft	39.00 to 40.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	45.00 to 46.00
Rails, 18 in. and under	49.00 to 50.00
Angles & splice bars	43.00 to 44.00
Rerolling rails	52.00 to 53.00
No. 1 cupola cast	51.00 to 52.00
Stove plate	49.00 to 50.00
Charging box cast	22.00 to 23.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	40.00 to 41.00

Youngstown

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	26.00 to 27.00
Machining shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. plate	19.00 to 20.00
Low phos. punch'gs. plate	34.00 to 35.00
Unstripped motor blocks	27.00 to 28.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machining shop turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. punch'gs. plate	29.00 to 30.00
No. 1 cupola cast	36.00 to 37.00
Heavy breakable cast	31.00 to 32.00
Stove plate	31.00 to 32.00
Automotive cast	37.00 to 38.00

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	26.00 to 27.00
Electric furnace, 3 ft & under	31.00 to 32.00
Machining shop turn.	9.00 to 10.00
Mixed bor. and short turn.	9.00 to 10.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast	34.00 to 35.00
Mixed cupola cast	30.00 to 31.00
Heavy breakable cast	29.00 to 30.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	26.00 to 27.00

San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	32.00
No. 2 bundles	22.00
Machining shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast	40.00

Los Angeles

No. 1 hvy. melting	\$34.00
No. 2 hvy. melting	32.00
No. 1 dealer bundles	30.00
No. 2 bundles	22.00
Machining shop turn.	8.00 to 11.00
Shoveling turnings	11.00 to 13.00
Cast iron borings	11.00 to 13.00
Electric. furn. 1 ft and under (foundry)	45.00
No. 1 RR hvy. melting	36.00
No. 1 cupola cast	40.00 to 42.00

Seattle

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 2 bundles	24.00
No. 1 cupola cast	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	\$32.00

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NONFERROUS MARKETS

Aluminum Producers Are the Target

Diecasters, extruders and smelters lash out at the Big 3 in Yates Committee hearing.

Primary target is Reynolds' hot metal contracts.

Extruders file a complaint with Justice Dept. on price discrimination.

■ The corporate ears of the Big 3 aluminum producers must have been burning last week. Spokesmen for custom die casters, independent extruders, and smelters said some sharp things about how Alcoa, Kaiser, and Reynolds conduct themselves in the marketplace.

Listening were Rep. Sidney R. Yates (D., Ill.), and his House Small Business subcommittee.

Sharp Tones — The tone of the testimony was sharp. A representative of Reynolds Metals Co. sat unofficially in the first row of spectators and heard his company's hot metal contracts called "a ruthless and arrogant scheme", by David Laine, executive secretary, American Die Casting Institute.

While Reynolds' contracts to supply Ford and General Motors with molten aluminum at lower prices than pig were the primary target, Alcoa and Kaiser came in for their share of sniping.

Smelter Competition — Carl Burton, secretary, Aluminum Smelters Research Institute, suggested that the House subcommittee look into conditions under which the smelters must compete with the Big 3. He told the committee that at least one of his members could cite scrap purchases and conversion

deals that had the effect of increasing the smelters' costs and weakening their position in the alloy ingot market.

Aaron J. Naisuler, Aluminum Extruders Council, told the Subcommittee his association believes it has evidence of price discrimination on the part of the Big 3, and presented this to the Dept. of Justice on February 23.

A spokesman for the Justice Dept. said several complaints against the large producers had been received, and that the situation was "being looked into."

Basic Issue — Basically, legality of hot metal contracts appears to hinge on whether molten metal is another form of pig or ingot, or a separate commodity.

"Pigging hot metal is nothing more or less than the process the housewife exercises when she puts hot jelly into a glass to cool and solidify," says Carl Burton. "Were she to bypass the cooling process and take the jelly directly from the stove to the table, hot, she would still be serving jelly."

A Reynolds spokesman pointed out that there is water in ice, but that on the market they are different products, with very different price structure. Joseph H. McConnel, Reynolds vice president, has referred to molten aluminum as a "fourth primary aluminum commodity."

Why is this such a vital point?

Key Point — Reynolds' price for molten aluminum is 10 pct less than the similar solid item, minus freight. On commercially pure aluminum this amounts to a discount of 2½¢ per lb, says Burton.

He cited testimony from Alcoa

and Kaiser to indicate this "discount" is much more than the cost of pigging aluminum, and letters from several smelters to pinpoint the cost at ¼¢ to ½¢ per lb. Mr. Burton asked the subcommittee to investigate the difference, saying "there is grave doubt that the prices do reflect bare savings of cost."

Premise — It was pointed out that Reynolds can not be accused of giving a preferential price unless molten aluminum is considered a form of pig and ingot. If it is another commodity, the price need not have any relationship to other basic aluminum prices.

Titanium

A major producer fell by the wayside last week when Cramet, Inc., Chattanooga, Tenn., announced it was turning its \$25 million federally-financed plant over to the government. Cramet is owned jointly by the Crane Co. and Republic Steel.

Capacity of the plant is about 6000 tons, of the U. S. titanium capacity of 31,000 tons.

Tin prices for the week: March 12—95.125; March 13—95.00; March 14—95.125; March 17—95.00; March 18—95.00.*

* Estimate.

Primary Prices

cents per lb)	Current price	last price	date of change
Aluminum pig	26.00	25.00	8/1/57
Aluminum Ingot	28.10	27.10	8/1/57
Copper (E)	25.00	27.00	1/13/58
Copper (CS)	23.00	23.50	2/26/58
Copper (L)	25.00	27.00	1/13/58
Lead, St. L.	12.00	13.30	12/2/57
Lead, N. Y.	13.00	13.50	12/2/57
Magnesium Ingot	36.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/58
Titanium sponge	200-250	105-250	1/29/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt alwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 148.

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NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate (“F” temper except 6061-0)				
Alloy	.032	.081	.136- .249	.250- .3
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	90.2-99.8

Screw Machine Stock—2011-T-3

Size*	1/4	3/8-5/8	5/8-1	1 1/4-1 1/2
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated (Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	\$1.420	\$1.893	\$2.367	\$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate				
Type↓	Gage→	250	.250-	.032
AZ31B Stand.		3.00	2.00	.188
Grade				.081
AZ31B Spec.		67.9	69.0	77.9
Tread Plate		93.3	95.7	109.7
Tooling Plate		70.6	71.7	
Tooling Plate		73.0		

Extruded Shapes

factor→	6-8	13-14	24-30	36-38
Comm. Grade.	69.6	70.7	75.6	89.2
Spec. Grade..	84.6	85.7	90.6	104.2

Alloy Ingots

AZ91B (Die Casting) 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

"A" Nickel	Monel	Inconel	
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	48.13		45.36	48.32
Bram, 70/30	42.69	43.23	42.63	45.60
Bram, Low	44.90	45.44	44.84	47.71
Bram, R L	45.67	46.21	45.61	48.48
Bram, Naval	47.07		41.38	50.48
Munts Metal	45.19		41.00	
Comm. Bs.	46.98	47.52	46.92	49.54
Mang. Bs.	50.81		44.91	
Phos. Bs. 5%	67.17		67.67	

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97 1/4%	22.00-23.00
Grade 2—92-95%	21.00-21.75
Grade 3—90-92%	20.00-20.75
Grade 4—85-90%	17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for
shipments of 20,000 lb and over)

Heavy	Turnings
Copper	21
Yellow brass	16 1/2
Red brass	18 1/2
Comm. bronze	19 1/2
Mang. bronze	14 1/2
Yellow brass rod ends	15 1/2

Customs Smelters Scrap

(Cents per pound carload lots, delivered
to refinery)

No. 1 copper wire	19 1/2
No. 2 copper wire	17 1/2
Light copper	15 1/2
No. 1 composition	17 1/2
No. 1 comp. turnings	17
Hvy. yellow brass solids	12 1/2
Brass pipe	14 1/2
Radiators	13 1/2

Ingot Makers Scrap

(Cents per pound carload lots, delivered
to refinery)

No. 1 copper wire	19 1/2
No. 2 copper wire	17 1/2
Light copper	15 1/2
No. 1 composition	17 1/2
No. 1 composition turnings	17
Cocks and faucets	11 1/2
Clean heavy yellow brass	9 1/2
Brass pipe	11 1/2
New soft brass clippings	12 1/2
No. 1 brass rod turnings	10—10 1/2

Aluminum

Alum. pistons and struts	5 1/2—6
Aluminum crankcases	10—10 1/2
1100 (25) aluminum clippings	13—13 1/2
Old sheet and utensils	10—10 1/2
Borings and turnings	6 1/2—7
Industrial castings	10—10 1/2
2024 (24S) clippings	11 1/2—12

Zinc

New zinc clippings	4
Old zinc	3 1/2
Zinc routings	1 1/2
Old die cast scrap	1 1/2—1 1/4

Nickel and Monel

Pure nickel clippings	42-48
Clean nickel turnings	37-40
Nickel anodes	42-45
Nickel rod ends	42-45
New Monel clippings	28-29
Clean Monel turnings	20-23
Old sheet Monel	25-26
Nickel silver clippings, mixed.	18
Nickel silver turnings, mixed.	15

Lead

Soft scrap lead	8 1/2—9
Battery plates (dry)	3 1/2—3 1/4
Batteries, acid free	2 1/2—2 1/4

Miscellaneous

Block tin	75
No. 1 pewter	59
Auto babbitt	39
Mixed common babbitt	11—11 1/2
Solder joints	14 1/2—15
Siphon tops	42
Small foundry type	12—12 1/2
Monotop	12—12 1/2
Lino. and stereotype	11—11 1/2
Electrotype	10—10 1/2
Hand picked type shells	7—7 1/2
Lino. and stereo. dress	3—3 1/2
Electro dress	2 1/2—2 1/2

(Effective March 17, 1958)

THE IRON AGE, March 20, 1958

IRON AGE STEEL PRICES	<i>Italics</i> identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.														
	BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP							
	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled	
EAST	Bethlehem, Pa.				\$114.00 B3		5.325 B3	7.80 B3	5.325 B3						
	Buffalo, N. Y.	\$77.50 R3, B3	\$96.00 R3, B3	\$114.00 R3, B3	6.225 B3	5.325 B3	7.80 B3	5.325 B3	4.925 R3, B3	7.15 S10	7.325 B3				
	Phila., Pa.										7.70 P15				
	Harrison, N. J.													15.85 C11	
	Comahocken, Pa.									4.975 A2	7.20 A2	7.325 A2			
	New Bedford, Mass.										7.60 R6				
	Johnstown, Pa.	\$77.50 B3	\$96.00 B3	\$114.00 B3		5.325 B3	7.80 B3								
	Boston, Mass.										7.70 T8			15.40 T8	
	New Haven, Conn.										7.60 D1				
	Baltimore, Md.										7.15 T8				
	Phoenixville, Pa.					5.325 P2		5.325 P2							
	Sparrows Pt., Md.									4.925 B3		7.325 B3			
	Bridgewater, Wallingford, Conn.										7.60 W1				
	Pawtucket, R. I. Worcester, Mass.										7.70 N7 7.70 A5			15.40 N7 15.20 T8	
	Alton, Ill.									5.125 L1					
MIDDLE WEST	Ashland, Ky.									4.925 A7					
	Canton-Massillon, Dover, Ohio										7.15 G4		10.45 G4		14.85 C11
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	\$77.50 U1, R3	\$96.00 U1, R3,W8	\$114.00 U1, R3,W8	6.225 U1	5.275 U1, W8,P13	7.75 U1,Y1 W8	5.275 U1	4.925 W8, N4,A1	7.25 A1,T8 M8				8.10 W8, S9,J3	15.05 A1, S9,C4
	Cleveland, Ohio										7.15 A5,J3		10.45 A5	8.10 J3	
	Detroit, Mich.										5.025 G3, M2	7.25 M2,D1, D2,G3,P11	7.425 G3	10.60 D2 10.55 G3	8.10 G3
	Anderson, Ind.										7.15 G4				
	Duluth, Minn.														
	Gary, Ind. Harbor, Indiana	\$77.50 U1	\$96.00 U1	\$114.00 U1, Y1		5.275 U1, I3	7.75 U1, I3	5.275 I3	4.925 U1, I3,Y1	7.15 Y1	7.325 U1, I3,Y1	10.60 Y1	8.10 U1, Y1		
	Sterling, Ill.	\$77.50 N4					5.275 N4			5.025 N4					
	Indianapolis, Ind.										7.30 J3				15.20 J3
	Newport, Ky.													8.10 A9	
	Middletown, Ohio														
	Niles, Warren, Ohio Sharon, Pa.										4.925 R3, S1	7.15 R3,T4 S1	7.325 R3, S1	10.50 S1 10.45 R3	8.10 S1 15.05 S1
	Owensboro, Ky.	\$77.50 G3	\$96.00 G5	\$114.00 G5											
WEST	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	\$77.50 U1, P6	\$96.00 U1, C11,P6	\$114.00 U1, C11,B7	6.225 U1	5.275 U1, J3	7.75 U1, J3	5.275 U1	4.925 P6	7.15 J3,B4, S7				8.10 S9 15.05 S9	
	Weirton, Wheeling, Follansbee, W. Va.					6.225 W3	5.275 W3			4.925 W3	7.15 W3,F3	7.325 W3	10.50 W3		
	Youngstown, Ohio	\$77.50 R3	\$96.00 Y1, C10	\$114.00 Y1				7.75 Y1			7.15 Y1,J3	7.325 U1, Y1	10.65 Y1	8.10 U1, Y1	15.05 J3 10.65 Y1
	Fontana, Cal.	\$88.00 K7	\$105.50 K1	\$135.00 K1			6.075 K1	8.55 K1	6.225 K1	5.675 K1	9.00 K1				
	Geneva, Utah						5.275 C7	7.75 C7							
	Kansas City, Mo.						5.375 S2	7.85 S2						8.35 S2	
	Los Angeles, Torrance, Cal.						5.375 C7, B2	8.45 B2			5.675 C7, B2	9.05 J3			9.30 B2 17.25 J3
	Minneapolis, Colo.						5.525 C6				6.025 C6	9.10 K1			
	Portland, Ore.						6.025 O2								
	San Francisco, Niles, Pittsburg, Cal.						5.925 B2	8.40 B2			5.675 C7, B2				
SOUTH	Seattle, Wash.						6.025 R2	8.50 B2			5.825 R2				
	Atlanta, Ga.						5.475 A8				5.125 A8				
	Fairfield, Ala. City, Birmingham, Ala.	\$77.50 T2	\$96.00 T2				5.275 T2, R1,C16	7.75 T2			4.925 T2, R3,C16		7.325 T2		
	Houston, Lone Star, Texas						5.375 S2	7.85 S2						8.35 S2	

(Effective March 17, 1958)

IRON AGE		Sheets								WIRE ROD	TINPLATE†		BLACK PLATE	
STEEL PRICES		Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized	Enamel- ing	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.925 B3	6.05 B3				7.275 B3	8.975 B3		6.15 W6	† Special coated mfg. terms deduct 50¢ from 1.25-lb. base box price. Can-making quality tinplate 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differential 1.00 lb. 0.25 lb. add 65¢.			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.975 A2	6.10 A2				7.325 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.													
	Fairless, Pa.	4.975 UI	6.10 UI				7.325 UI	9.025 UI						
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.925 B3	6.05 B3	6.60 B3			7.275 B3	8.975 B3	9.725 B3	6.25 B3	\$10.15 B3	\$8.85 B3		
	Worcester, Mass.													
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.									6.35 L1				
	Ashland, Ky.	4.925 A7		6.60 A7	6.625 A7									
	Canton-Massillon, Dover, Ohio			6.60 R3, R1										
	Chicago, Joliet, Ill.	4.925 W8, A1					7.275 UI			6.15 A5, R1 W8, N4, K2				
	Sterling, Ill.									6.25 N4, K2				
	Cleveland, Ohio	4.925 R3, J3	6.85 R3, J3		6.625 R3		7.275 R3, J3	8.975 R3, J3		6.15 A5				
	Detroit, Mich.	5.025 G3, M2	6.15 G3, 6.05 M2				7.375 G3	9.075 G3						
	Newport, Ky.	4.925 A1	6.05 A1											
	Gary, Ind. Harbor, Indiana	4.925 UI, J3, Y1	6.85 UI, J3, Y1	6.60 UI, J3	6.625 UI, J3, Y1	7.00 UI	7.275 UI, Y1, J3	8.975 UI, Y1		6.15 Y1	\$10.05 UI, Y1	\$8.75 J3, UI, Y1	7.50 UI, Y1	
	Granite City, Ill.	5.125 G2	6.25 G2	6.80 G2	6.825 G2									
	Kokomo, Ind.			6.70 C9						6.25 C9				
	Manfield, Ohio		6.05 E2			7.00 E2								
	Middletown, Ohio		6.05 A7	6.60 A7	6.625 A7	7.00 A7								
WEST	Niles, Warren, Ohio Sharon, Pa.	4.925 R3, N3, S1	6.05 R3	6.60 R3	6.625 N3, S1, R3	7.00 N3, S1, R3	7.275 R3	8.975 S1, R3						
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 UI, J3, P6	6.05 UI, J3, P6	6.60 UI, J3	6.625 UI		7.275 UI, J3	8.975 UI, J3	9.725 UI	6.15 A5, J3, P6	\$10.05 UI, J3	\$8.75 UI, J3	7.50 UI, J3	
	Portsmouth, Ohio	4.925 P7	6.05 P7							6.15 P7				
	Weirton, Wheeling, Fellowsbee, W. Va.	4.925 W3, W5	6.05 W3, F3, W5	6.60 W3, W5		7.00 W3, W5	7.275 W3	8.975 W3			\$10.05 W5, W3	\$8.75 W5, W3	7.50 W5	
	Youngstown, Ohio	4.925 UI, Y1	6.05 Y1		6.625 Y1		7.275 Y1	8.975 Y1		6.15 Y1				
	Fontana, Cal.	5.675 K1	7.30 K1				8.025 K1	10.275 K1						
	Geneva, Utah	5.025 C7												
	Kansas City, Mo.										6.40 S2			
	Los Angeles, Torrance, Cal.										6.95 B2			
	Minnequa, Colo.										6.40 C6			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 C7	7.00 C7	7.35 C7							6.95 C7	\$10.00 C7	\$8.50 C7	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.925 T2, R3	6.05 T2, R3	6.60 T2, R3	6.625 T2					6.15 T2, R3	\$10.15 T2	\$8.85 T2		
	Houston, Tex.										6.40 S2			

(Effective March 17, 1958)

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
STEEL PRICES		BARS					PLATES				WIRE	
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs', Bright
EAST	Bethlehem, Pa.				6.475 B3	8.775 B3	7.925 B3					
	Buffalo, N. Y.	5.425 R3, B3	5.425 R3, B3	7.35 B5	6.475 B3, R3	8.775 B3, B5	7.925 B3	5.10 B3		7.20 B3		7.65 W6
	Claymont, Del.								5.10 C4		7.20 C4	7.625 C4
	Coatesville, Pa.								5.10 L4		7.20 L4	7.925 L4
	Conshohocken, Pa.								5.20 A2	6.175 A2	7.20 A2	7.625 A2
	Harrisburg, Pa.								5.10 P2	6.275 P2		
	Milton, Pa.	5.575 M7	5.575 M7									
	Hartford, Conn.			7.80 R3		8.875 R3	7.925 B3					
	Johnstown, Pa.	5.425 B3	5.425 B3		6.475 B3			5.10 B3		7.20 B3	7.625 B3	7.65 B3
	Fairless, Pa.	5.575 U1	5.575 U1		6.625 U1							
	Newark, N. J. Camden, N. J.				7.75 W10 7.75 P10							
	Bridgewater, Conn. Putnam, Conn. Willimantic, Conn.				7.85 W10 7.80 J3	6.55 N8	8.925 N8					
	Sparrows Pt., Md.		5.425 B3					5.10 B3		7.20 B3	7.625 B3	7.75 B3
	Palmer, Worcester, Reedville, Mass. Manassas, Mass.			7.85 B5, C14		8.875 A5, B5						7.95 A5, W6
	Spring City, Pa.			7.75 K4		8.95 K4						
	Alton, Ill.	5.825 L1										7.85 L1
	Ashland, Newport, Ky.							5.10 A7, A1		7.20 A1		
	Canton, Massillon, Ohio			7.30 R3, R2	6.475 R3, T5	8.775 R3, R2, T5						
MIDDLE WEST	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 U1, R3, W8, N4, P13	5.425 U1, R3, N4, P13	7.30 A5, W10, W8 B5, L2, N9	6.475 U1, R3, W8	8.775 A5, W10, W8 L2, N8, B5	7.925 U1, W8	5.10 U1, A1, W8, I3	6.175 U1	7.20 U1, W8	7.625 U1, W8	7.65 A5, R3, W8, N4, K2, W7
	Cleveland, Ohio Elyria, Ohio	5.425 R3	5.425 R3	7.30 A5, C13 C18		8.775 A5, C13, C18	7.925 R3	5.20 R3, J3	6.175 J3		7.625 R3, J3	7.65 A5, C13
	Detroit, Mich.	5.825 G3	5.775 G3	7.55 P3 7.50 P8, B5	6.475 R5 6.575 G3	8.775 R5 8.975 B5, P3, P8	8.025 G3	5.20 G3		7.35 G3		
	Duluth, Minn.											7.65 A5
	Gary, Ind., Harbor, Crawfordsville, Hammond, Ind.	5.425 U1, J3, Y1	5.425 U1, J3, Y1	7.30 R3, J3	6.475 U1, J3, Y1	8.775 R3, M4	7.925 U1, Y1	5.10 U1, J3, Y1	6.175 J3, J3	7.20 U1, Y1	7.625 U1, Y1, J3	7.75 M4
	Granite City, Ill.								5.30 G2			
	Kokomo, Ind.											7.75 C9
	Sterling, Ill.	5.825 N4	5.825 N4					5.10 N4				7.75 K2
	Niles, Warren, Ohio Sharon, Pa.			7.30 C10	6.475 C10, S1	8.775 C10	7.925 S1	5.10 R3, S1		7.20 S1	7.625 R3, S1	
	Owensboro, Ky.	5.425 G5			6.475 G5							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 U1, J3	5.425 U1, J3	7.30 A5, B4, R3, J3, C11, W10, S9, C8	6.475 U1, J3, C11, B7	8.775 A5, W10, R3, S9, C11, C8	7.925 U1, J3	5.10 U1, J3	6.175 U1	7.20 U1, J3, B7	7.625 U1, J3, B7	7.65 A5, J3, P6
	Portsmouth, Ohio											7.65 P7
	Worthington, Wheeling, Follansbee, W. Va.							5.10 W5				
	Youngstown, Ohio	5.425 U1, R3, Y1	5.425 U1, R3, Y1	7.30 A5, Y1, F2	6.475 U1, Y1	8.775 Y1, F2	7.925 U1, Y1	5.10 U1, R3, Y1		7.20 Y1	7.625 U1, R3, Y1	7.65 Y1
WEST	Emeryville, Cal. Fontana, Cal.	6.175 J5 6.125 K7	6.175 J5 6.125 K7		7.525 K7		8.825 K7	5.90 K1		8.90 K1	8.425 K1	
	Geneva, Utah							5.10 C7			7.625 C7	
	Kansas City, Mo.	5.675 S2	5.675 S2		6.725 S2		8.175 S2					7.90 S2
	Los Angeles, Torrance, Cal.	6.125 C7, B2	6.125 C7, B2	8.75 R3, P14	7.525 B2	10.75 P14	8.625 B2					8.60 B2
	Minneapolis, Colo.	5.875 C6	5.875 C6					5.95 C6				7.90 C6
	Portland, Ore.	6.175 O2	6.175 O2									
	San Francisco, Niles, Pittsburg, Cal.	6.125 C7 6.175 B2	6.125 C7 6.175 B2				8.675 B2					8.60 C7, C6
	Seattle, Wash.	6.175 B2, N6	6.175 B2				8.675 B2	6.90 B2		8.10 B2	8.525 B2	
	Atlanta, Ga.	5.825 A8	5.825 A8									7.85 A8
	Fairfield, Ala., City, Birmingham, Ala.	5.425 T2, R3, C16	5.425 T2, R3, C16	7.30 C16			7.925 T2	5.10 T2, R3			7.625 T2	7.65 T2, R3
SOUTH	Houston, Ft. Worth, Lone Star, Tex.	5.675 S2	5.675 S2		6.725 S2		8.175 S2	5.20 S2 5.20 L3	7.30 S2	7.725 S2	7.90 S2	

(Effective March 17, 1958)

† Merchant Quality—Special Quality 35¢ higher.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armcro Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newsport Steel Co., Newport, Ky.
B1 Bahoco & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafing Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shaping Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connor Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G7 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Green Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.
H1 Hanna Furnace Corp., Detroit
I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland
J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jeasop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. Co., Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.
K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.
L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.
O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland
P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit

P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.
R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R6 Roehling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.
S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S5 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston
U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham
W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS													
	3/8 in.		5/8 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.		3 1/2-4 in.							
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.		
Sparrows Pt. B3	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50														
Youngstown R3	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50														
Fontana K1	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+12.00														
Pittsburgh J3	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50						
Alton, Ill. L1	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50														
Sharon M3	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50														
Fairless N2	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50														
Pittsburgh N1	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50						
Wheeling W5	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50														
Wheatland W4	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50														
Youngstown Y1	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50						
Indiana Harbor Y1	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00														
Lorain N2	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50						
EXTRA STRONG PLAIN ENDS																												
Sparrows Pt. B3	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50														
Youngstown R3	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50														
Fairless N2	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50														
Fontana K1	+3.75	0.25	3.25	3.75	4.25	4.75	5.25																					
Pittsburgh J3	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50						
Alton, Ill. L1	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50														
Sharon M3	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50														
Pittsburgh N1	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50						
Wheeling W5	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50														
Wheatland W4	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50														
Youngstown Y1	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50						
Indiana Harbor Y1	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50														
Lorain N2	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50						

Threads only, butt-weld and seamless 2 1/2 pt. higher discount. Plain ends, butt-weld and seamless, 2-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1 1/2, 2 1/2 and 3-in. 1 pt.; 2-in., 2 1/2 and 3-in. 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective March 17, 1958)

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)
Pot. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
1/4" and smaller x 6"	49	54	56	57
5/8" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts 1/4" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" and shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44 1/2	47	48 1/2
Plow bolts, 1/2" and smaller x 6" and shorter	49	54	56	57

(Add 25 pot for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
5/8" in. or smaller	60 1/2
5/8" in. to 1 1/4" in. inclusive	55 1/2
1 1/4" in. to 1 1/2" in. inclusive	58 1/2
1 1/2" in. and larger	53 1/2

C. P. Hex, reg. & hvy.	60 1/2
5/8" in. and smaller	60 1/2
5/8" in. to 1 1/4" in. inclusive	55 1/2
1 1/4" in. and larger	53 1/2

Hot Galv. Hex Nuts (All Types)	46 1/2
5/8" in. and smaller	46 1/2

Semi-finished Hex Nuts	60 1/2
5/8" in. or smaller	60 1/2
5/8" in. to 1 1/4" in. inclusive	55 1/2
1 1/4" in. and larger	53 1/2

(Add 25 pot for broken case or keg quantities)

Finished	63
5/8" in. and smaller	63

Rivets	Base per 100 lb
1/2" in. and larger	\$12.25
7/16" in. and smaller	19

Cap Screws	Discount (Packages)
New std. hex head, packaged	Full Finished H. C. Heat Treat
5/8" diam. and smaller x 6" and shorter	40 26
5/8" 7/8" and 1" diam. x 6" and shorter	22 3
5/8" diam. and smaller x longer than 6"	8 +13
5/8" 7/8" and 1" diam. x longer than 6" + 6	+32
	C-1018 Steel
	Full-Finished
	Cartons Bulk
1/4" through 5/8" dia. x 6" and shorter	58 49
5/8" through 1" dia. x 6" and shorter	45 33
Minimum quantity—1/4" through 5/8" diam., 15,000 pieces; 1/16" through 5/8" diam., 5,000 pieces; 5/8" through 1" diam., 2,000 pieces.	

Machine Screws & Stove Bolts	Discount
Plain Finish	Mach. Stove Screws Bolts
Cartons	60 60
Bulk	Quantity
To 1/4" diam.	25,000-and over
Incl.	60 ..
5/16 to 1/2" diam.	15,000-200,000
Incl.	60 ..

Machine Screws & Stove Bolt Nuts	Discount
In Cartons	Hex Square
In Bulk	Quantity

5/8" diam. & smaller	25,000 and over	14	16
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CAST IRON WATER PIPE INDEX

Birmingham 125.8
New York 138.7
Chicago 140.9
San Francisco-L. A. 148.6
Dec. 1955, value, Class B or heavier
5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue.
Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer,	
5000 lb lots	40.00
Electrodeposited	31.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	16.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes \$1.13 per lb (approx.)	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	68.70
Copper sulphate, 100 lb bags, per cwt.	22.15
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., (Philadelphia price 24.50)	24.05
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh	
Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb, and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb, and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to \$2.85
Aluminum, freight allowed	38.0¢
Brass, 10 ton lots	\$1.1¢ to 47.1¢
Copper, electrolytic	41.5¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe, 0.5 max. Del'd	\$5.00
Lead	21.5¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	\$3.60 to \$3.95
Nickel, chemically precipitated	\$1.05
Nickel, unannealed	\$1.00
Nickel, annealed	\$1.06
Nickel, spherical, unannealed #80	\$1.13
Silicon	43.5¢
Solder powder	13¢ plus met. value
Stainless steel, 302	\$1.02
Stainless steel, 316	\$1.20
Tin	14.00¢ plus metal value
Zinc, 99% (65 mesh) \$3.75 (nominal)	
Zinc, 5000 lb & over	17.5¢ to 30.7¢

Metropolitan Price, dollars per 100 lb.

Ware-Houses	City Delivery Charge	Sheets		Strip	Plates	Shapes	Bars		Alloy Bars				
		Hot-Rolled (18 ga. & over)	Cold-Rolled (15 ga. & over)				Hot-Rolled (10 ga. & over)	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 As rolled	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 As rolled
Atlanta	8.59	9.87	18.13	8.64	8.97	9.05	9.01	10.68					
Baltimore	\$10	8.38	8.98	9.78	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57				
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.25	8.69	9.05	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.35	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.90	9.78	9.80	9.98	10.65				17.60
Detroit	.15	8.58	9.85	10.60	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston	.10	7.10	8.40		7.25	7.70	7.25	7.20	11.10	16.20		19.30	19.05
Kansas City	.20	9.02	10.27	10.82	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	8.60**	10.85	11.75	8.65	8.65	8.70	8.65	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	.15	8.48	9.73	10.35	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.60	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland	.10	8.50	11.20	11.55	9.05	8.80	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.50	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.00	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.61	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.81	18.96
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81		15.26		19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** All sizes except 18 and 16 gage. †† 10¢ zinc. † Deduct for country delivery. † 3/16 in. to 1/2 in. • C1018—1 in. rounds.

(Effective March 17, 1958)

To identify producers, see Key on preceding page

TOOL STEEL

F.o.b. mill	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	\$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
18	4	2	—	—	1.155	M-1
1.5	4	1.5	8	—	1.545	M-3
6	4	3	6	—	1.30	M-2
6	4	2	5	—	1.30	M-2
High-carbon chromium	—	—	—	—	.925	D-3, D-5
Oil hardened manganese	—	—	—	—	.475	O-2
Special carbon	—	—	—	—	.36	W-1
Extra carbon	—	—	—	—	.36	W-1
Regular carbon	—	—	—	—	.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Plate (A3, J2, L6, C4)			Sheet (12)		
	Cladding	10 pct	15 pct	20 pct	20 pct	—
302	—	—	—	—	37.50	—
304	—	37.95	42.25	46.70	40.00	—
316	—	44.40	49.50	54.50	58.75	—
321	—	48.85	44.60	49.30	47.25	—
347	—	42.40	47.55	52.80	57.00	—
405	—	29.85	33.35	36.85	—	—
410	—	29.55	33.10	36.70	—	—
430	—	29.80	33.55	37.25	—	—

CR Strip (S9) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	Min 1 Sali. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer U1	5.525	6.50	6.975	—	—	—	14.75
Cleveland R3	—	—	—	9.75	—	—	—
St. Chicago R3	—	—	—	—	—	—	—
Easley T2	5.525	6.50	—	9.75	6.60	—	—
Fairfield T2	—	6.50	—	9.75	6.60	—	—
Gary U1	5.525	—	—	—	—	—	—
Huntington C16	—	6.50	—	—	—	—	—
Ind. Harbor B3	5.525	6.975	9.75	—	6.60	—	—
Ind. Harbor Y1	—	6.50	—	9.75	6.60	—	—
Johnstown B3	—	6.50	—	—	—	—	—
Joliet U1	—	6.975	—	—	—	—	—
Kansas City S2	—	—	—	9.75	—	—	—
Lackawanna B3	5.525	6.50	6.975	—	6.60	—	—
Lebanon B3	—	6.975	—	14.50	—	—	—
Minnequa C6	—	6.975	—	—	—	—	—
Pittsburgh P5	5.525	7.00	6.975	9.75	6.60	14.75	—
Pittsburgh J3	—	—	—	9.75	—	—	—
Seattle R2	5.525	6.975	—	10.25	6.75	15.75	—
Struthers Y1	—	—	—	—	6.60	—	—
Torrance C7	—	—	—	—	6.75	—	—
Williamsport S5	6.50	—	—	—	—	—	—
Youngstown R3	—	—	—	9.75	—	—	—

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	\$15.00 to \$15.75
Foundry, beehive (f.o.b.)	\$17.50 to \$19.00
Foundry oven coke	
Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account. Gross Ton	
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

F.o.b. Mill Cents Per Lb	22-Gage	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
			Semi- Processed	Fully Processed
			9.625	
			11.10	10.85
			11.00	11.35
			12.00	12.05
			12.90	12.65
			13.95	13.70
			15.00	14.75
			15.55	15.25

F.o.b. Mill Cents Per Lb	Trans. 58	Trans. 52	Grain Oriented	
			Trans. 66	Trans. 20 20
			Trans. 60	Trans. 19.20
			Trans. 73	Trans. 19.70

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (A9); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville, Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

Diam. (In.)	Length (In.)	Price	GRAPHITE			CARBON*		
			Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100,110	10.70	—	—	—
20	72	25.25	35	110	10.70	—	—	—
16	72	25.75	30	110	10.85	—	—	—
14	72	25.75	24	72 to 84	11.25	—	—	—
12	72	26.25	20	90	11.80	—	—	—
10	60	28.00	17	72	11.40	—	—	—
10	48	28.50	14	72	11.85	—	—	—
7	60	28.25	12	60	12.95	—	—	—
6	60	31.50	10	60	13.00	—	—	—
4	40	35.00	8	60	13.30	—	—	—
3	40	37.00	—	—	—	—	—	—
2½	30	39.25	—	—	—	—	—	—
2	24	60.75	—	—	—	—	—	—

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000	
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00)	\$135.00
No. 1 Ohio	120.00
No. 2 Ohio	120.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty	
Hays, Pa., Athens, Tex., Winkham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Easley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton
Standard chemically bonded, Balt.
Standard chemically bonded, Curtin, Calif.
Burned, Balt.

Magnesite Brick

Standard Baltimore	\$131.00
Chemically bonded, Baltimore	116.00

St. % to ½-in. grains
Domestic, f.o.b. Baltimore in bulk
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.
in bulk
in sacks

Dead Burned Dolomite

Per net ton
F.o.b. bulk, producing points in:
Pa., W. Va., Ohio
Midwest
Missouri Valley

(Effective March 17, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Col	Col	Standard Q Coated Nails	
			Wires Fence Post	Wire Bale Ties
Alabama City R3	173	187	212 193	8.65 9.20
Aliquippa J3***	173	190	190	8.65 9.325
Atlanta A8**	175	192	214 198	8.75 9.425
Bartonville K2**	175	192	178 214 198	8.75 9.425**
Buffalo W6	—	—	—	8.65
Cleveland A6	—	—	—	8.65
Crav'dav. M4**	175	192	214 198	8.75 9.425
Donora, Pa. A5	173	187	212 193	8.65 9.20
Duluth A5	173	187	212 193	8.65 9.20
Fairfield, Ala. T2	173	187	212 193	8.65 9.20
Galveston D4	—	—	—	8.65
Houston S2	178	192	217 198	8.65 9.45
Jacksonville M6	184-1	197	219 20	

PIG IRON

Dollars per gross ton, f.o.b.,
subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. <i>B6</i>	68.00	68.50	69.00	69.50	
Birmingham <i>R3</i>	62.00	62.50			
Birmingham <i>W9</i>	62.00	62.50	66.50		
Birmingham <i>U4</i>	62.00	62.50	66.50		
Buffalo <i>R3</i>	66.00	66.50	67.00	67.50	
Buffalo <i>H1</i>	66.00	66.50	67.00	67.50	
Buffalo <i>W6</i>	66.00	66.50	67.00	67.50	
Chester <i>P2</i>	66.50	67.00	67.50		
Chicago <i>I4</i>	66.00	66.50	66.50	67.00	
Cleveland <i>A5</i>	66.00	66.50	66.50	67.00	71.00
Cleveland <i>R3</i>	66.00	66.50	66.50	67.00	
Duuth <i>I4</i>	66.00	66.50	66.50	67.00	71.00
Erie <i>I4</i>	66.00	66.50	66.50	67.00	71.00
Everett <i>M6</i>	67.50	68.00	68.50		
Fontana <i>K1</i>	75.00	75.50			
Geneva, Utah <i>C7</i>	66.00	66.50			
Granite City <i>G2</i>	67.00	68.00	68.50		
Hubbard <i>Y1</i>			66.50		
Ironton, Utah <i>C7</i>	66.00	66.50			
Midland <i>C11</i>	66.00				
Minnequa <i>C6</i>	68.00	68.50	69.00		
Monessen <i>P6</i>	66.00				
Neville Is. <i>P4</i>	66.00	66.50	66.50	67.00	71.00
N. Tonawanda <i>T1</i>	66.50	67.00	67.50		
Sharpaville <i>S1</i>	66.00	66.50	66.50	67.00	
So. Chicago <i>R3</i>	66.00	66.50	66.50	67.00	
So. Chicago <i>W8</i>	66.00		66.50	67.00	
Swedenell <i>A2</i>	68.00	68.50	69.00	69.50	
Toledo <i>I4</i>	66.00	66.50	66.50	67.00	
Troy, N. Y. <i>R1</i>	62.00	68.50	69.00	69.50	74.00
Youngstown <i>Y1</i>			66.50	67.00	

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 0.50 to 0.75 pct nickel, \$1 for each addition 0.25 pct nickel.

Add \$1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, \$79.25; Jackson *J1*, *J4* (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Kokuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under 10 pct phos.); \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	48.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	48.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	48.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *J3*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass., (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bars: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *W2*; McKeesport, Pa., *U1*; *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T3*, *R3*; Ft. Wayne, *J4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*.

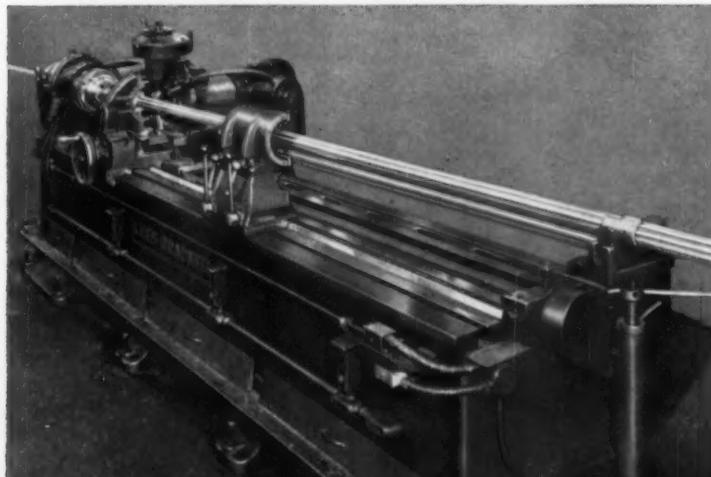
Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structural: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

(Effective March 17, 1958)

A "SHORT-CUT" to... L-O-N-G Splines



The LEES-BRADNER SPLINE HOBBLING MACHINES

These quick facts about Lees-Bradner SH Spline Hobbing Machines make them the most versatile of their type ever made:

- Extra long beds available to hob splines up to 144" between centers.
- Large hole in work spindle handles pieces up to 6" in diameter.
- No clumsy obstructions to interfere with loading and unloading.
- Machines operate with push-button controls within easy reach of operator.
- Can hob either straight or helical splines plus spur and helical gears.
- For the complete story send for your free SH Spline Hobber brochure.

HOBS UP TO 144" BETWEEN CENTERS

the **LEES-BRADNER**
Company
CLEVELAND 11, OHIO • U.S.A.

Send For Your
FREE Brochure On
LEES-BRADNER
SH Spline Hobbers.

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.	38.00
0.02% C	41.00
0.05% C	39.00
0.10% C	38.50
0.20% C	38.25
4.00-4.50% C, 60-70% Cr, 1-2% Si, 28.75	38.00
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si	27.50
0.025% C (Simplex)	36.75
0.10% C, 52-57% Cr, 2.00% max Si	37.50
7-8 1/2% max C, 50-55% Cr, 3-6% max Si	25.00
7-8 1/2% max C, 50-55% Cr, 3% max Si	25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 37% min. Cr, 1% max. Fe.	\$1.31
0.10% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/8" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads	\$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.)	
Carloads, delivered, lump, 3-in. x down, packed.	
Price is sum of contained Cr and contained Si.	

Cr	Si
Carloads	27.50
Ton lots	32.75
Less ton lots	34.35

Calcium-Silicon

Per lb of alloy, lump, delivered, packed.	
36-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads	25.65
Ton lots	27.95

Less ton lots	29.45
-------------------------	-------

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	24.25
Ton lots	26.15

Less ton lots	27.15
-------------------------	-------

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.	
Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.	
Manganese Silicon	
16 to 19% 3% max.	\$100.50
19 to 21% 3% max.	102.50
21 to 23% 3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	34.00
Ton lots	36.00
25 to 1999 lb	38.00
Premium for Hydrogen removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn	25.50
--	-------

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	37.15 39.95 41.15
0.07% max. C	35.10 37.90 39.10
0.10% max. C	34.35 37.15 38.35
0.15% max. C	33.60 36.40 37.60
0.30% max. C	32.10 34.90 36.10
0.50% max. C	31.60 34.40 35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60 31.40 32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area.	
Si 15.01 to 15.50 pct., f.o.b. Niagara Falls, N. Y., \$93.00.	
Less ton lots	22.40

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.	
Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.	
50% Si	14.20
55% Si	15.25
65% Si	19.50
90% Si	16.40
75% Si	18.10
85% Si	19.50

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95
Less ton lots	2.40	3.30

4.55

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	11.80¢
Ton lots	4.30

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo

\$1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	\$4.25
Less ton lots	4.30

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C del'd ton lots, 2-in. x D per lb can't Sb plus Ta

\$3.70

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo

\$1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton

\$90.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

\$1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

\$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per ton net ton

\$240.00

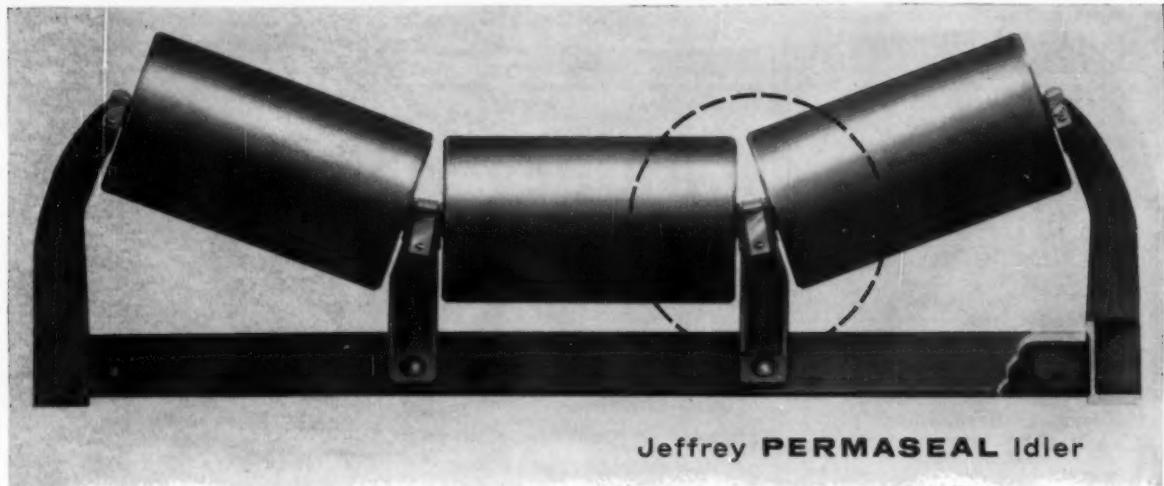
Ferrotungsten, 3/4 x down packed, per pounds contained W

\$2.60

Molybde oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa.

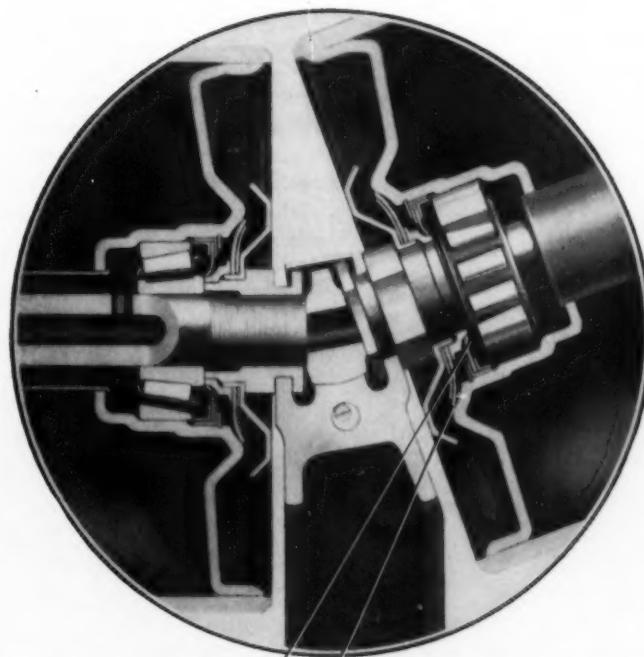
\$1.41

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Jeffrey **PERMASEAL** Idler

Diaphragm double seal for extra-severe, extra-satisfying service



THIS SEAL KEEPS DIRT OUT
THIS SEAL KEEPS GREASE IN

Jeffrey Permaséal belt idlers give you extra-long service with an absolute minimum of maintenance. You can see why. The diaphragm double seals protect both ends of every roller. Grease can't get out; dirt can't get in.

And the positive seal means you can add grease to either side of a Jeffrey Permaseal idler without danger that grease might escape from the other side onto the conveyor belt. No grease pipes are needed.

Greater dependability and longer life offset slightly higher initial cost.

Complete facts on the extras you get from Jeffrey are available in Catalog 909. Write The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.

CONVEYING • PROCESSING • MINING EQUIPMENT...
TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

JEFFREY

RAILWAY EQUIPMENT

FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS

All Types

SERVICE-TESTED

FREIGHT CAR REPAIR PARTS

For All Types of Cars

LOCOMOTIVES

Diesel, Steam, Gasoline

Diesel-Electric

SPECIAL

STANDARD GAUGE CARS

COVERED HOPPER CARS

10-70 Ton Capacity

ORE HOPPER CARS

660 Cubic Feet

40- and 50-Ton Capacity

SIDE DUMP CARS

5-Air-operated, Austin-Western

30-Cubic Yard

3 Drop and 2 Lift Door Type

RAILWAY TANK CARS and STORAGE TANKS

6,000- 8,000- and 10,000-Gallon

Cleaned and Tested

CRANES

Overhead and Locomotive

IRON & STEEL PRODUCTS, Inc.

General Office

13496 S. Brainerd Ave.

Chicago 33, Illinois

Phone: Mitchell 6-1212

New York Office

50-8 Church Street

New York 7, N. Y.

Phone: BEEKMAN 3-8226

"ANYTHING containing IRON or STEEL"

GUARANTEED RE-NU-BUILT

ELECTRIC POWER EQUIPMENT

DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2000	Elliott		230	325
1	2250	Elliott		600	200/380
1	2200	G.E.	MCF	600	460/560
1	1750	Elliott		250	175/350
1	1375	G.E.	MCF	415	1800
1	1200	G.E.	MCF	600	450/600
1	940	Whse.	QM	250	140/170
1	800	G.E.	MCF	250	400/750
1	450	Whse.		550	415
2	300	G.E.	MPC	220	400
2	200	Whse.	CB-207.4	250	850/1200
2	125	Whse.	SK-100	230	450/1200
1	150	G.E.	CDBB	600	250/700
1	150	Cr. Wh.	65-H	220	1150
1	125	Whse.	185	250	350/650
2	100	Whse.	SK-181	230	450/1000
1	75	G.E.	CD-1231	230	850
1	50	G.E.	MD-412-AE	230	850
6	40	Rel.BB	885TEFC	230	500/1500
1	1500	Whse.		525	600
1	750	G.E.	MCF	600	450/900
1	750	G.E.	MCF	600	360/720
1	750	G.E.	MCF	600	120/360

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC	AC
1	2000	G.E.	514	600	2500/4600
2	1750/2100	G.E.	514	250/300	2500/4600
1	1500	G.E.	600	600	4100/2300
2	1000	G.E.	729	600	6600/13200
1	500	G.E.	729	125/250	2200/4600
1	500	Whse.	900	125/250	400
1	500	G.E.	900	125/250	400/2300
1	375	G.E.	900	125	4100/2300/440
2	300	G.E.	1200	250	2300
1	250	Whse.	1200	275	2300
1	200	Whse.	1200	550	2300
1	200	G.E.	1200	250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	3333	Whee.	OISC	1	13800 x 2300
1	1500	G.E. auto	HT	1	4800/4200/4400
2	1000	G.E.	HVD/DF	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
2	750	G.E.	Ftrans	1	4800 x 83/55
3	500	G.E. auto	OISC	1	6600/13200 x 8800
2	500	Melones	OISC	1	6600/13200 x 8800/23000
1	225	Marcus	Auto-air	1	208/220
Unused					
2	150	G.E.		1	33000/2300/4000Y
3	100	Whee.	OISC	1	4600/2300 x 460/230/115
3	100	G.E.	OISC	1	22000/2400/160Y
Unused					

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

THE CLEARING HOUSE

January Sales Made Strong Gain

Used machinery business rebounded in January with gain of 33.4 over December index.

Month was best for the industry since last July.

Used machinery dealers are welcoming some good news.

According to the latest report on sales by the Machinery Dealers National Assn., January was the best month for business since last summer. (See chart below.)

The January sales index, taking 1947-1949 monthly sales as a base of 100, showed a rebound to 121.1. This was a gain of 33.4 over the December level of 87.7. In fact, January topped every month in the second half of 1957 except July when the sales index registered 125.3.

Supply Drought Cuts Sales in Ohio

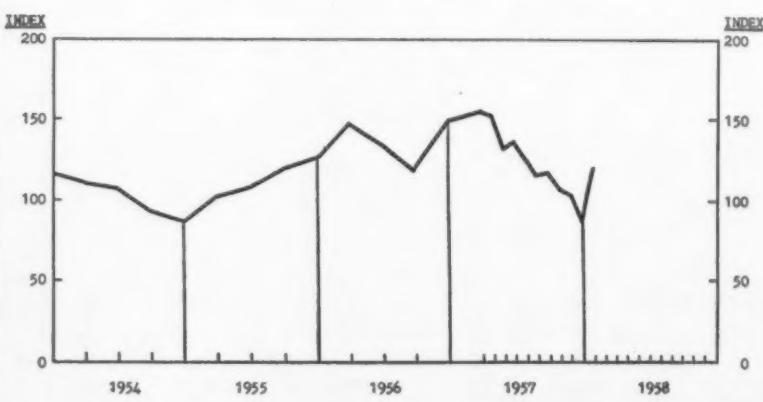
Used steel mill equipment is showing some signs of a pickup in the Ohio market but there is a

severe shortage of good machinery available.

"I've been trying to find two 42 and 44 in. by 100 in. 2-high reversing blooming mills for over a year," says Lou F. Kinderman, Niles, Ohio, steel mill equipment dealer. "I have tried all over the U. S. as well as Europe. Used mills in this category are worth something over \$400,000—but there aren't any around."

Inquiries Improve — The used steel mill machinery business generally is slow because most industry expansion is using new equipment. Deliveries of new equipment are short term. But there has been a significant increase in inquiries for used units compared to 30 days ago, which looks good for future business.

Inquiries are generally concentrated on heavy cranes, blooming mills, slitting lines and bar mills. While demand is good, most of the available machinery to fill it is in poor condition. Mills apparently are keeping most machinery they have except worn-out units.



CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS

9" x 1/4" Bertsch Initial Type
10" x 10" Ga. Bertsch Initial Type
10" x 1/2" King Pyramid Type
10" x 1" Niles Pyramid Type
BORING MILL—HORIZONTAL
Cincinnati Gilbert Model J—1/2" Dia. Spindle, 30" Travel, 10' 6" Table—NEW 1956

BRAKE-PRESS TYPE

10" x 1/4" & 12" x 1/4" Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H 50' Span 220/3/60
5 ton 50' Span 115 Volt D.C.
5 ton Cleveland 50' Span 230 Volt D.C.
5 ton Shepard Niles 70' Span 230 Volt D.C.
8 ton P&H 50' Span 220/3/60
10 ton Shepard Niles 30' Span 440/3/60
10 ton Shaw 40' Span 230 Volt D.C.
10 ton Shaw 130' Span 230 Volt D.C.
15 ton Shepard Niles 50' Span 230 Volt D.C.
20 ton Niles 50' Span 440/3/60
20 ton Northern 50' Span 440/3/60
20 ton P&H 60' Span 220/3/60
20 ton Shepard Niles 70' Span 220/3/60

CUT-OFF MACHINE

24" diameter capacity 2" OD Max.

DRAW BENCHES

8,000# Waterbury Farrel Single Draw 20 Ft. Length of Draw

10,000# Astoria Standard Single Draw 44 Ft. Length

FLANGING MACHINE

5" McCabe Pneumatic Flanging Machine

FORGING MACHINES

1" to 5" Arco, Ajax, National

FURNACE—MELTING

15 ton Heraut Top Charge, 12" Shell Complete with Transformer

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING

800 lb. to 12,000 lb. Incl.

HEADERS

2500 Manville Solid Die Single Stroke

244 Waterbury Farrel DSOD Cyl. 5" x 6"

LEVELERS—ROLLER

87' Torrington, 19 Rolls 1 31/32", dia.

20' Voss Changer, Capacity .025 to .075

PRESSES—DRAULIC

600 ton HPM Fastraverse, Bed 50" x 38"

600 ton Elmes, 36" Stroke, 48" x 45" Bed, Cyl.

1500 ton Manville 15" Stroke, Bed 49" x 48"

1500 ton Manville 15" Stroke, Bed 49" x 48"

1500 ton Manville 15" Stroke, Bed 49" x 48"

1500 ton Manville 15" Stroke, Bed 49" x 48"

PRESS—KNUCKLE JOINT

600 ton Bliss No. 25, 2 1/2" Stroke, Bed 24 x 20"

PRESSES—STRAIGHT SIDE

180 ton Hamilton 24" Str. 35% Bet. Up.

200 ton Clearing F1200-42 Stroke 30", Bed 44" x 28"

250 ton Bliss 81 7/8" Str. Bistr. 33" x 39"

PUNCH & SHEAR—CUTTING

Cleveland Style C Arch Jaw, Cyl. 5" x 5"

Cleveland Style EEF, Arch Jaw, Cyl. 1 1/4" x 1"

Cleveland Style G Single End, 60" Throat

Cleveland Style W, 60" Throat, Architectural Jaw

HIVETER

80 ton Hanna Bull Riveter 24" Gap, 18" Beach.

10" x 10" Dia. x 1/2" Dia.

TORRINGTON FLAT WIRE MILL LINE

Two Stand Two High 6" x 5", Comp. with Acc.

ROLLING MILLS

8" x 10" Single Stand Two High

10" x 14" Single Stand Two High

10" x 16" Single Stand Two High

12" x 16" Single Stand Two High

12" x 16" Single Stand Two High

Manufacturing

A. T. HENRY & COMPANY, INC.

50 CHURCH ST., NEW YORK CITY 8

Telephone COrtlandt 7-3437

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

10" x 24" Single Stand Two High

20" x 36" Single Stand Two High

ROLLS—FORMING

6 Stand Yoder, 1 1/4" Dia. 1/2" Thick

14 Stand Yoder, 2 1/2" Dia. 1/2" Thick

18 Stand Custom Built, 2 1/2" Dia. 1/2" Thick

14 Stand Custom Built, 1 1/4" Dia. 1/2" Thick

ROLLS—PLATE STRAIGHTENING

108" Bertsch, Seven Rolls 9" Dia. Motor Driven

72" Niles, 6 Rolls 9" Dia. Motor Driven

SCREW—ALLIGATOR

No. 6 Model 10' L.H. Capacity 2" x 12"

SHEAR LINES

36" x 1,020 Ga. Halidex Shear Line

42" Bliss Up-Cut Shear, Capacity .125" Max. With Hump & Run-out Tables

SHEARS—SQUARING

10" x 1 1/2" Cincinnati #1810

SCREW ANGLE

6 x 6 x 1/4" Hilles & Jones

SLITTER

36" Wean Slitting Line

STRAIGHTENER

24" Halidex Straightening & Cutting Machine

No. 3 Median 3 Roll, Capacity 4" x 12" Tubing

Torrington 12" x 12" Cyl. 1 1/2" Dia. 1/2" Thick

No. 4 Median 3 Roll, Capacity 1 1/2" x 12" Bars

No. 6 Median 2 rolls, Capacity to 1 1/2" dia. Bars

No. 8 Suton, Capacity 5/16" to 3/8" dia. Bars, 1/4" to 1" OD Tubes

SWAGING MACHINE

26 1/2" Face Capacity 3/8" Tube, 1 1/4" Solid.

10" Dia. Hydraulic Feed, LATE

WIRE DRAWING MACHINES

Type B Morgan 4-Roll, Capacity .25 Red down

No. 2 Vaughn 15-Die Continuous, Capacity .214 to .337

Equipment

Consulting Engineering Service

Surplus Mfg. Equipment Inventories Purchased

DIESEL LOCOMOTIVES

3-25 Ton 1-98 Ten GE 42 in. Ga.

1-18 Ton 38 Ton Plymouth 36 in. Ga.

1-25 Ton GE Standard Gauge

ELECTRIC AIR COMPRESSORS

3-470-C.F.M.—Inq. Rend. 40 T 220/440

3-3170 C.F.M.—Inq. Rend. PRE 2-600 MP

STANHOPE, 60 E. 42nd St., N. Y. 17, N. Y.

MILES FOR VALUES

New Stock Catalog Available

96" Model 420 Barnes deep hole drill, 2 spindle

180 ton No. 27 Williams and White bulldozer

6" capacity No. 401 Campbell "Cutomatic" abrasive cut-off

2850 CFM Worthington 650 HP synchronous motor electric drive compressor

20" swing No. 217 Baker Brothers box column heavy duty upright drill

4" arm 9" column Cincinnati Bickford super service radial

24" Cincinnati 4 spindle upright drill, spindle motor drive

No. 15 1/2" Foote Burt vertical hydraulic feed

driver for a multiple head (2)

28" x 72" London type D heavy duty plain hydraulic cylindrical grinder

53" No. 24A Gardner vertical spindle horizontal disc grinder, 15 HP, multiple vee belt dr.

8" x 24" No. 35 Abrasive grinder

300 lb. No. 3C Chambersburg pneumatic forging hammer

28 Nasel forging hammer

4" bar Universal "Tri-Way" horizontal boring, milling and drilling machine

30" x 30" x 8" Cincinnati Hydro two rail, one right hand side head, dial feed planer

400 ton No. 444 Toledo tiered frame knuckle joint coining press

600 ton Elmes cast steel high speed downward acting hydraulic press

500 ton Baldwin Southwick high speed hydraulic vertical downward working press

800 ton Model 2E48-800 Hamilton straight side single crank air clutch press

750 ton No. 3 National all steel Maxipress

96" x 16" capacity Beatty No. 29 power squaring shear, late

Ask for latest stock list

MILES MACHINERY CO.

PHONE SAGINAW PL 2-3105

2041 E. GENESEE AVE. SAGINAW, MICH.

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

Qu. K.W. Make R.P.M. Volts A.C. Volts A.C.

3" 3500 Al.Ch. 314 250/700 13800/9000/

1" 2500 Al.Ch. 720 800 4100/2400

1" 1250 G.E. 132/245 450 4100

1" 1250 Whee. 800 720 4000/2800

1" 1000 Whee. 125/250 720 4000/2300

1" 600 Whee. 125/250 1200 440

1" 500 Cr. Wh. 125/250 800 2200

1" 500 Al.Ch. 250/500 900 2200

1" 500 Al.Ch. 350/700 1200 2200

3" 300 Whee. 125/250 1200 4000/2800

2" 200 Whee. 250/500 1200 2200

1" 150 G.E. 250 1200 4000/2800

1" 150 Whee. 250 1200 2200

* 3-units sets

Complete G.E. Outdoor Switchgear consisting of 5 watertight subbuses, (5) mainline type AM, 1200 amps, 5 KV magnesite drawout 3-pole air circuit breakers, 100,000 KV Int. cap. (2) mainline metering equipment, batteries, etc. BARGAIN IF WE CAN SHIP DIRECTLY FROM PRESENT LOCATION.

DIRECT CURRENT MOTORS

230-Volt

Qu. HP Make Type R.P.M.

1" 3000 G.E. F.Vent. 200/300

1" 1500 G.E. F.Vent. 140/180

1" 1000 G.E. F.Vent. 90/120

1" 600 G.E. Mill-B.B. 110/130

2" 600 Al.Ch. Mill 300/400

1" 400 G.E. Ped. Br. 450

1" 300 Whee. Mill 300

2" 275 Whee. Mill-QM 425/550

1" 180 G.E. M.P.C. 400

1" 175 G.E. M.P.C. 450/600

1" 125 G.E. M.P.C. 400

1" 125 Whee. SK-184 575/550

1" 100 G.E. CD-175 400/800

1" 100 Rel. 481-T 1150/1500

1" 80 Rel. 551-T 550/1050

1" 50 Whee. SK-131 500/1500

1" 50 G.E. Encl. F.C. 400/800

2" 40/30 Whee. T.K.F.C. 500/1500

* 300/800-Volt

** 600-Volt

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 48, Penna.

Cable Address Phone

"Macsteel" Philadelphia, Pa. Davenport 4-8300

6' x 14 ga. Pexto Power Shear.

600 Ton Southwick Inclined Wheel Press.

5' x 3/16" Beloit Initial Bending Roll.

FALK MACHINERY COMPANY

Grand Central Palace, New York

60 Park Bldg., Pittsburgh, Pa.

100 Lake Street, Reno, Nevada

1200 Metropolitan Bank Bldg., Miami, Fla.

THE IRON AGE, March 20, 1958

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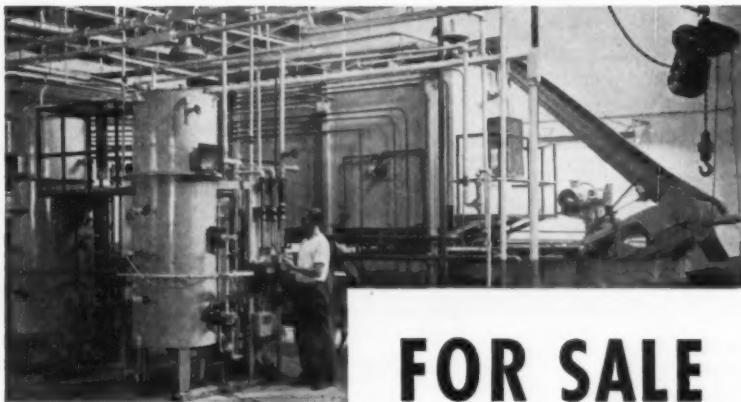
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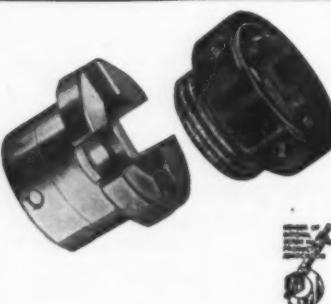
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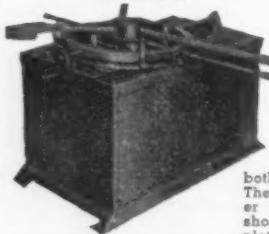
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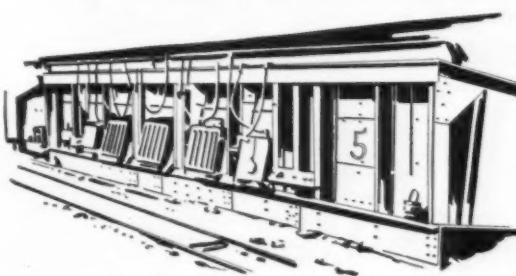
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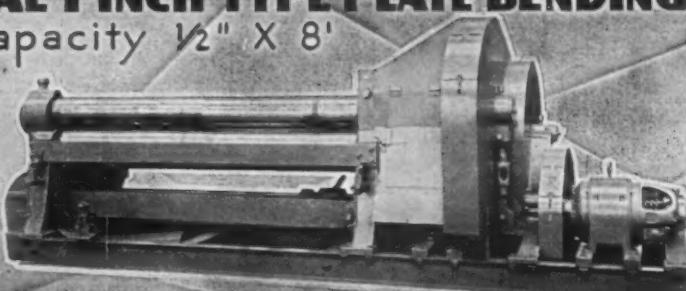
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your watch!**

**Rotoblast® cleans quickly and
automatically...gives you more
production with less manpower!**

This control panel on the Pangborn Rotoblast Barrel is a symbol.

It stands for *speed*—push the Start button and a few minutes later you can push the one for Stop. It means *automatic operation*—just one man is needed to run it. And *quality*, too—between Start and Stop, whirling Rotoblast thoroughly blast cleans your castings to a silvery finish.

From original engineering through rugged construction to expert installation, Pangborn Rotoblast Machines are designed to satisfy you on every count—speed, performance, maintenance.

The Pangborn Engineer in your area will be glad to take off his coat and go to work on your cleaning problem at no obligation. And, for more information, write today for Bulletin 227 to: PANGBORN CORP., 1500 Pangborn Blvd., Hagerstown, Md. Manufacturers of Blast Cleaning and Dust Control Equipment.



Pangborn Rotoblast Barrel for efficient batch cleaning. Available in 1½, 3, 6, 12, 18, 30 and 72 cubic foot sizes.

Clean it fast with

Pangborn
ROTOBLAST



Name your bearing needs...we'll meet 'em pronto from 30 types, 10,247 sizes

TIME and time again, machinery makers come to the Timken Company for help with some special bearing application problem. One they think hasn't been solved before. And time after time, from our 30 types and 10,247 sizes of Timken® tapered roller bearings, we've come up with the bearing design to do the job and at minimum cost.

It's no accident that we can help out so often. In over 50 years of helping machinery builders with bearing problems, we've engineered

and produced the world's largest selection of tapered roller bearings. And we've constantly improved our designs. The answers to thousands of bearing application problems are already in our files. Ready and available to help you.

And machine users get the same swift service if they ever need a replacement Timken bearing. Even for old machines, they can almost always count on immediate delivery of Timken bearings for replacement.

Why not call on our engineers for

help whenever you have a bearing application problem or requirement? Timken is your No. 1 bearing value. Wherever wheels and shafts turn, Timken bearings eliminate friction, cutting wear and maintenance to a minimum. Specify bearings trade-marked "Timken" for the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".



*This symbol on a product means
its bearings are the best.*

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD